



FRIDAY, FEBRUARY 16.

Hill's Spark Arrester.

The spark arrester designed by Rufus Hill, Master Mechanic of the Camden & Atlantic Railroad, is intended not only to prevent the escape of cinders and unconsumed fuel from the chimney, but also, by regulating and equalizing the draft through the tubes, to effect a reduction in the amount of solid matter drawn from the fire-box by the action of the exhaust.

It is a recognized fact that in locomotive and other tubular boilers the draft is materially stronger through the upper than through the lower tubes, this being due to the natural tendency of the escaping products of combustion to ascend, promoted by the higher temperature which prevails in the

and heavy excursion trains, their performance has been satisfactory in all particulars.

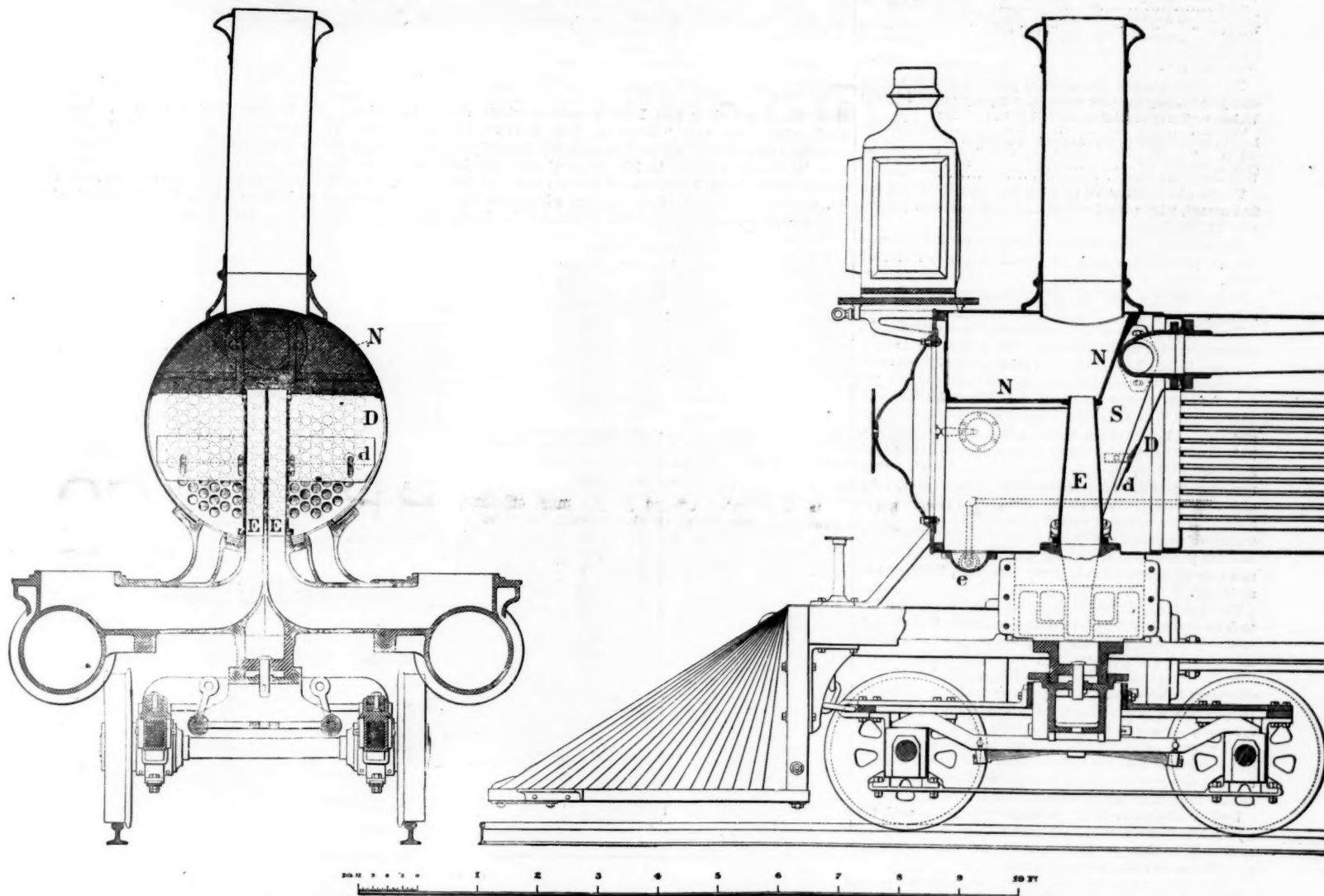
The deflecting plate *D* is secured to the front tube-plate, just above the upper row of tubes, and, after projecting horizontally for such distance as to afford a space between the flue-sheet and its adjacent side sufficient for the free discharge of the products of combustion from the top row of tubes, is thence inclined downwardly and outwardly from the flue-sheet to its lower edge, thus affording a uniformly increasing area of horizontal section in the discharge space formed between it and the tube-plate, in correspondence with the increasing areas of tube section presented by the several lower rows of tubes in front of which it is located. The deflector is connected at its sides to the boiler shell and smoke-box, so as to make tight joints therewith, and, to admit of such variation in the opening beneath it as may be required by differences in the duty or steaming qualities of engines or in the character of fuel employed, an adjustable section *d* is attached to its lower side, by bolts passing through slotted holes, so as to be raised or lowered, as desired. The use of the deflecting plate enables the usual

sylvania, the Richmond, Fredericksburg & Potomac, the Central Pacific, the Western Maryland and other railroads, and the single driver engine sent to England by the Eames Vacuum Brake Co. The spark arrester is manufactured under the patents of Rufus Hill, re-issue No. 9,524, Jan. 4, 1881, and No. 260,753, July 11, 1882, controlled by the Hill National Spark Arrester Co., of which J. Snowden Bell, No. 913 Walnut street, Philadelphia, is General Agent.

Contributions.**The Relation of Operating Expenses to Dead Weight.**

TO THE EDITOR OF THE RAILROAD GAZETTE:

Success in any department of industry is dependent upon very little things. We often wonder why similar enterprises conducted under similar but separate managements do not both prove equally successful. We wonder at these different results because we do not understand the causes operating to bring them about. To know the reasons of success or



HILL'S SPARK ARRESTER.

upper portion of the boiler. The upper tubes hence do more and the lower less than their normal duty, and the portions of fuel which are lifted from the grate bars by the exhaust are drawn, relatively, rapidly through the upper tubes and slowly through the lower ones, tending, in the former case, to be thrown forcibly out of the stack, and, in the latter, to clog the tubes. To counteract the effect of such unequal action, a deflecting plate *D* is located by Mr. Hill in front of the flue head, and acts, by checking the undue draft through the upper tubes, to proportionately induce an increased draft through the lower ones, also deflecting the escaping sparks and cinders from the natural upward course towards the bottom of the smoke-box, where the action of the exhaust is insufficient to overcome their gravity and carry them with the gases out of the chimney. The lighter particles are arrested by a netting *NN*, the construction of which is such as to afford ample separating surface without undue increase of the size of the smoke-box.

The illustrations, which are, respectively longitudinal and transverse sections at the centre of the chimney, show the improvements as applied to engines Nos. 17 and 18 of the Camden & Atlantic Railroad. These engines, which were built by the Baldwin Locomotive Works, are of the standard American pattern, with 16 by 24-in. cylinders, 5-ft. 6-in. drivers, and fire-boxes 9 ft. 1½ in. by 42 in. inside dimensions (grate surface 31.9 sq. ft.). They are adapted to burn either anthracite or bituminous coal, but have been used principally with the latter, and in service, on fast express

petticoat or lift pipe to be dispensed with, and a long exhaust pipe *E* is employed, giving a straight-shot exhaust into an open 16-in. stack.

The netting *N*, which is of ¼-in. mesh wire, extends horizontally across the smoke-box, from a plate at its front to the rear of the exhaust pipe, and thence is inclined upwardly, between the steam pipes *S* and the lower opening of the chimney, being secured to the smoke-box by angle-iron extending along its horizontal and inclined portions. A hand-hole and bonnet on the side of the smoke-box, shown in dotted lines, afford access to the lower sides of the netting, and there is also an opening in the front plate above the netting, closed by a sliding cover. Cinders and unburned fuel which collect in the smoke-box are blown out by a jet of steam through the ejector *e*, or they may be dropped into a "sub-treasury" below the smoke-box. With fire-boxes of proper proportions, as in the engines referred to, an extension of the smoke-box beyond that which will admit of the attachment of an ejector or discharge pipe is not found to be either necessary or advisable, but the deflecting plate and netting are equally applicable where an extended smoke-box is considered to be a proper spark receptacle.

The Hill spark arrester is now in use, with satisfactory results, on a large number of engines, about 213 having been fitted with it by the Baldwin Locomotive Works, among which are 42 on the Manhattan (Elevated) Railroad, New York, the entire equipment of the Shenandoah Valley Railroad, 25 in number, together with engines of the Penn-

sylvania, the Richmond, Fredericksburg & Potomac, the Central Pacific, the Western Maryland and other railroads, and the single driver engine sent to England by the Eames Vacuum Brake Co. The spark arrester is manufactured under the patents of Rufus Hill, re-issue No. 9,524, Jan. 4, 1881, and No. 260,753, July 11, 1882, controlled by the Hill National Spark Arrester Co., of which J. Snowden Bell, No. 913 Walnut street, Philadelphia, is General Agent.

failure we must analyze critically all the conditions under which both are conducted. These reflections are suggested by certain facts coming to the knowledge of the writer, which at the present moment concern deeply every railroad enterprise in the country.

"Practical" men cannot be blamed for shrinking from undertaking to solve hard problems of a scientific or theoretic nature, but when a simple question of practical economy is demonstrated, it seems a little willful in those interested if they do not show some inclination to profit by the fact.

In dealing with this question a digression from the subject may be pardoned, simply to enforce its practical points; it will perhaps assist in reaching a sudden conclusion as to the office of science in practical things. I use the word "practical" as commonly applied at the present day.

It would seem a useless waste of time and material to attempt to demonstrate by any process of "practical" experiment the law of gravitation, for that is already determined by science; and yet many people in planning their mechanical devices go on as if no such force was in operation. Science is ascertained knowledge of facts, and should be a means used by which to determine quickly practical results.

There are certain laws which govern the strength of materials and the application of forces. Why not use them in connection with our "practical" experience and judgment? "Practical" knowledge alone only reaches to that which is

the pressure of water keeping it tight against the cylinder. I is the lowering screw, by turning which the water is forced back into the cistern by the weight of the ram and load. The pivot near the bottom of the cylinder allows a small amount of lateral play, by which the ram can follow the circular movement of the carriage about the end axle on which it turns.

A locomotive traversing jack on the same principle is shown in fig. 3, which has a traversing screw similar to an ordinary jack. The height of the jacks when down is 20 in., the run out 10 in. or 12 in., the traverse 12 in. and 22 in., and the load 12 to 20 tons, according to size.

The Strength of Cast-Iron Car-Wheels.

We have been requested by a wheel manufacturer to republish the following report of a test made in London in 1875, and first published in the *Railroad Gazette* of Nov. 28, 1877:

The wheel experimented upon was made by the Barnum Richardson Co., Salisbury, Conn., United States of America, and was one of a number of cast-iron chilled car-wheels sent over to England about six years ago, and which have been lying since then, unused, at the Canada Works, Birkenhead. The wheel was made from the Barnum Richardson Co.'s Salisbury iron, and bears the date "Jan. 2, 1868," in raised letters on the casting. In character and pattern the wheel was the same as those supplied by that company for many years to the principal railways in the United States and Canada.

The weight as ascertained by the weighing machine at Mr. Horn's works was 626 lbs. English.

The wheel was laid flat on the ground, with the flange side uppermost, and the blows directed to the inside of the single plate. The sledge hammers weighed 28 and 32 lbs., and were well handled by experienced smiths, striking in pairs, and relieving each other from time to time.

At the 61st blow a very slight crack was discovered. Blows were continued at the same place, and at other points round on the same single plate, but although they succeeded in causing fresh cracks, it was not until the 395th blow that a piece about 9 in. long was broken off the wheel. The surfaces of the fractured part showed the iron to be of a very regular quality. The chilled portion of the tread, or wearing surface, was fully $\frac{3}{8}$ in. deep, resembling the hardest or most compact steel.

The wheel was then turned over, and blows given to the double-plate portion near to one of the three core-holes. The result of this was to break off, after repeated blows, some pieces of the iron from the sides of the core-hole, making the latter into an elongated opening, instead of a small circular hole. The cracks from these blows did not extend any distance down the plate, and no apparent effect was produced on the opposite or double plate. The surface of the iron where pounded, appeared more like an excellent quality malleable iron, and showed distinctly the dents made by the hammers.

The Barnum Richardson Co. state that it is the specially superior quality of the Salisbury iron which allows them to apply their chilling process so successfully to the circumference of the wheel, and yet leave the iron in the remaining portion with its toughness and tenacity unimpaired. To this tenacity they attribute the great safety of their wheels during the extremely low temperature of the American and Canadian winters, when instances of breaking from frost are unknown.

The correctness of this statement is certified to by Lieut.-Colonel J. J. Kennedy and Messrs. Charles Sadd, W. H. Mills, Charles Robbins and Wm. E. Horn, who were present at the test.

Southern Railway & Steamship Association.

The following is an official record of the proceedings of the annual convention held in Washington Jan. 16 and 17 last:

Pursuant to call, as per Circular letters Nos. 19 and 20, the Convention of the Southern Railway & Steamship Association assembled at the Metropolitan Hotel this day at noon, and was called to order by the President.

Upon call of the roll, as per voting membership list of 1882, 40 out of the 45 members responded through their representatives as follows:

Atlanta & Charlotte Air Line, T. M. R. Talcott, General Manager.

Atlanta & West Point, C. Gabbett, General Manager; A. J. Orme, General Freight Agent.

Brunswick & Albany, James R. Davis, Agent.

Central Railroad & Banking Co., of Georgia, W. G. Raoul, President; G. A. Whitehead, General Freight Agent.

Charleston & Savannah, H. S. Haines, General Manager; C. D. Owens, General Agent.

Charlotte, Columbia & Augusta, A. C. Haskell, President; T. M. R. Talcott, General Manager; D. Cardwell, Assistant General Freight Agent.

Georgia Railroad & Banking Co., J. W. Green, General Manager; E. R. Dorsey, General Freight Agent.

Louisville & Nashville, H. M. Smith, Vice-President; J. M. Culp, General Freight Agent.

Macon & Brunswick, J. R. Ogden, General Freight Agent.

Marietta & North Georgia, Hon. Joseph E. Brown.

Mobile & Girard, W. G. Raoul.

Montgomery & Eufaula, W. G. Raoul, President; W. F. Shellman, Superintendent.

Nashville, Chattanooga & St. Louis, J. W. Thomas, General Superintendent; G. R. Knox, General Freight Agent.

Northwestern North Carolina, T. M. R. Talcott, General Manager.

Port Royal & Augusta, W. G. Raoul, President; J. S. Davant, General Freight Agent.

Richmond & Danville, T. M. R. Talcott, General Manager; J. H. Drake, General Freight Agent.

Richmond, York River & Chesapeake, T. M. R. Talcott, General Manager.

Rome Railroad, E. Hillyer, President.

Savannah, Florida & Western, H. S. Haines, General Manager; James L. Taylor, General Freight Agent.

Savannah, Griffin & North Alabama, W. G. Raoul.

South Carolina, H. P. Talmadge, President; John B. Peck, General Manager; S. B. Picketts, General Freight Agent; Waring, Claim Agent.

Western Railroad of Alabama, C. Gabbett, General Manager.

Western & Atlantic, Hon. Joseph E. Brown, President; R. A. Anderson, Superintendent; J. M. Brown, General Freight Agent.

Wilmington, Columbia & Augusta, Hon. R. R. Bridgers, President; T. M. Emerson, General Freight Agent.

Wilmington & Weldon, Hon. R. R. Bridgers, President; M. Emerson, General Freight Agent.

Baltimore & Savannah Steamship Co., George J. Appold, President; William Plummer, Assistant to President.

Baltimore, Chesapeake & Richmond Steamboat Co., Reuben Foster, General Manager.

Baltimore Steam Packet Co., R. L. Poor, General Freight Agent.

Boston, Baltimore & Norfolk Steamship Co., George J. Appold, President; V. D. Groner, Agent.

Boston & Charleston Steamship Co., George W. Quintard, President.

Boston & Savannah Steamship Co., George A. Whitehead.

New York & Charleston Steamship Co., George W. Quintard, President; B. D. Hasell, General Manager.

New York & South Carolina Steamship Co., Theo. G. Eger.

Ocean Steamship Co.'s New York & Savannah Line, W. G. Raoul.

Ocean Steamship Co.'s Philadelphia & Savannah Line, W. G. Raoul; W. L. James, Agent.

Old Dominion Steamship Co.'s New York, Norfolk & Richmond Line, W. H. Stanford, Secretary and General Freight Agent.

Old Dominion Steamship Co.'s New York & West Point Line, W. H. Stanford, Secretary and General Freight Agent.

Philadelphia & Charleston Steamship Co., Theo. G. Eger.

Philadelphia, Norfolk & Richmond Steamship Co., Theo. G. Eger.

Providence & West Point Steamship Co., George J. Appold, President; William Plummer, Assistant to President.

In addition there were also present representatives of lines working with the Association as follows:

Virginia, Tennessee & Georgia Air Line, Henry Fink, General Manager.

Cincinnati, New Orleans & Texas Pacific, John Scott, President; E. P. Wilson, General Freight Agent.

Associated Lines of Virginia & the Carolinas, Sol Haas, Traffic Manager.

Northeastern of Georgia, G. J. Foreacre, President.

Raleigh & Gaston, Raleigh & Augusta Air Line and Carolina Central, F. W. Clark, General Freight Agent.

Memphis & Charleston, T. S. Davant, Assistant General Freight Agent.

Richmond & Petersburg, J. R. Kenly, Superintendent.

Also present were W. H. Rhett, General Agent Great Southern Freight Lines via Charleston and Savannah; R. D. Carpenter, General Agent; J. Hollingshead, Agent Associated Lines Virginia and Carolinas; T. E. Walker, Claim Agent Green Line, and officers of the Association, Hon. Joseph E. Brown, President; Virgil Powers, General Commissioner; Charles A. Sindall, Secretary; Milo S. Freeman, Clearing House Agent; E. T. Hughes, General Agent.

After a record of representatives had been made the proceedings of the last convention were read and approved.

It being stated that a Committee of General Managers had prepared a revision of the agreement and rules, the convention adjourned until 4 p. m., 17th, in order to allow a conference of all General Managers present.

SECOND DAY.

The convention was called to order. Hon. R. R. Bridgers, as Chairman for the Committee of General Managers, stated that the Committee had prepared as a report a revised agreement, which was read as follows:

AGREED: That the Southern Railway & Steamship Association be continued under the following agreement:

THIS AGREEMENT, made this 17th day of January, A. D. 1883, by and between the Central Railroad & Banking Co., of Ga., Savannah, Griffin & North Ala. Railroad Co., Mobile & Girard Railroad Co., Atlanta & West Point Railroad Co., Western Railroad of Ala., Port Royal & Augusta Railroad Co., South Carolina Railway Co., Georgia Railroad Co., East Tennessee, Virginia & Georgia Railroad Co., Norfolk & Western Railroad Co., Memphis & Charleston Railroad Co., Richmond & Danville Railroad Co., Charlotte, Columbia & Augusta Railroad Co., Columbia & Greenville Railroad Co., Louisville & Nashville Railroad Co., Mobile & Montgomery Railroad Co., South & North Ala. Railroad Co., Cincinnati, New Orleans & Texas-Pacific Railroad Co., Alabama Great Southern Railroad Co., Vicksburg & Meridian Railroad Co., Savannah, Florida & Western Railway Co., Charleston & Savannah Railroad Co., Wilmington, Columbia & Augusta Railroad Co., Wilmington & Weldon Railroad Co., Seaboard & Roanoke Railroad Co., Nashville, Chattanooga & St. Louis Railway Co., Old Dominion Steamship Co., Merchants & Miners Transportation Co., Clyde Steamship Lines, Baltimore, Chesapeake & Richmond Steamboat Co., New York and Charleston Steamship Co., Ocean Steamship Co., Boston and Savannah Steamship Co., and also such other transportation companies as may hereafter, by consent of said parties, subscribe hereto—

Witnesseth, That whereas the establishment and maintenance of tariffs of uniform rates, and the prevention of unjust discrimination, such as necessarily arises from the irregular and fluctuating rates which inevitably attend the separate and independent action of transportation lines, is important for the protection of the public;

And whereas it is deemed to be to the mutual advantage of the public and the transportation companies, that business in which they have a common interest should be so conducted as to secure a proper correlation of rates such as will protect the interests of competing markets without unjust discrimination in favor of or against any city or section;

And whereas these objects can be attained only by co-operation on the part of the various transportation lines engaged in the traffic of the territories south of the Potomac and Ohio rivers and east of the Mississippi River;

Now, therefore, in order to secure such co-operation among the said transportation lines, by providing means for the prompt adjustment of the differences which may arise between them; by placing all of their traffic common to two or more companies under the control of officers jointly elected; by the general conduct of the same, under well-defined rules and regulations, and by just and equitable divisions of business, such as will naturally ensue from the maintenance of rates, or by actual appointment; it is mutually agreed as follows:

First. That the organization herein provided for may include all such railways east of the Mississippi and south of the Potomac and Ohio rivers, and the steamship lines connecting them with Boston, Providence, New York, Philadelphia and Baltimore, which transact business with each other; provided such parties are included in this agreement, or may hereafter be admitted as parties thereto by the action of a general convention; and that the association herein formed shall be styled "The Southern Railway and Steamship Association."

Second. That the representatives of the several companies members of the Association shall meet in convention annually, on the third Wednesday in October, in the city of Atlanta, or at such other places as may be mutually agreed upon; and special meetings may be called at any time, as hereinafter provided.

Third. The business to be transacted in general convention shall be confined to the election of officers and fixing

their salaries, the admission of new members and their representation on the Executive Committee, and the adjustment of such matters as cannot properly be determined by the Executive Committee with the aid of the Board of Arbitration. Each Company, a member of the Association, shall have one vote. Two-thirds of the whole vote of the members present shall be required to make the action of the convention binding. Companies, members of the Association, may be represented in the convention by the President, Vice-President, General Manager, Superintendent, or General Freight Agent, in person, or by proxy; provided their proxy presents to the Secretary a properly attested power of attorney. In case of more than one nomination being made for any office, the election shall be by ballot.

Fourth. The Virginia, Tennessee & Georgia Air-Line, Richmond and Danville Railroad Line, Great Southern Freight Line via Savannah, Great Southern Freight Line via Charleston, Louisville & Nashville Line, Cincinnati, New Orleans & Texas-Pacific Line, Savannah, Florida & Western Line, Western & Atlantic Railroad Company, Atlantic Coast Line, Nashville Chattanooga & St. Louis Railway, Coastwise Steamship Association, shall each designate a representative, who shall be authorized to represent them in all matters of business with the Association or its members, and the several representatives so designated shall constitute an Executive Committee, of which the General Commissioner shall be chairman. If any company or line which is entitled to a representative fail to appoint one, or if their representative be not present at any meeting of the Executive committee, such company or line shall be represented by the General Commissioner, acting as their agent under the authority conferred by this agreement.

Fifth. The Executive Committee shall meet, at the call of the Chairman, whenever and wherever, in his judgment, it is necessary, or when any three members of the committee request it; but all such calls must state the object of the meeting and the subjects to be acted upon by the committee. All absent members shall be represented by the General Commissioner, whose duty it shall be to make himself familiar with their views and interests, so that he can represent them properly; and votes cast by the General Commissioner for absent members, at any meeting, on any subject stated in the call, shall have the same force and effect, in binding such members, as if cast by them in person. Other subjects than those mentioned in the call may be considered and acted on in the meeting of the Executive Committee; but the assent of absent members must be obtained, or the decision of the Board of Arbitration, before such action becomes binding on them. The Executive Committee shall have jurisdiction over all matters relating to the joint traffic, but shall act only by unanimous consent of all its members. In event of failure to agree, the questions at issue shall be settled by the Board of Arbitration hereinafter provided for. But this shall not be construed to give the Executive Committee or the General Commissioner any control over the local business of any company, even though such local business may of necessity pass through points at which the traffic is divided by apportionment.

Sixth. The Executive Committee shall have the right, at their discretion, to appoint sub-committees either of their own number or from among the officers and agents of the Companies members of the Association, and to delegate to such sub-committees jurisdiction over such matter as may be specially committed to their charge, but the sub-committees shall act only by unanimous consent; and failing to agree, the questions at issue must be referred to the Executive Committee for settlement. The General Commissioner will be, *ex officio*, chairman of all sub-committees, and as such shall be the medium of communication between the sub-committees and the Executive Committee. Absent members of sub-committees will be represented by the General Commissioner as in the case of absent members of the Executive Committee. During the interim between the reference of any matter of difference from a sub-committee to the Executive Committee and the final determination of such matter, the General Commissioner shall, if it be a matter requiring prompt action, have authority to decide it temporarily; and his decision shall be binding on all parties until reversed by the Executive Committee or by arbitration.

Seventh. The following officers shall be elected at the annual meeting, and shall hold their offices until the next annual meeting, and thereafter until their successors are elected: A president, a general commissioner, a secretary, an arbitrator, an auditor.

Eighth. The President shall preside over all general meetings of the Association, certify to the records of such meetings and communicate the proceedings to all the members. He shall call a general meeting of the Association whenever he is requested to do so by three members of the Executive Committee, or whenever it is, in his judgment, necessary to do so.

Ninth. The Secretary shall make complete and accurate records of the proceedings of all general meetings of the Association, the originals of which shall be preserved in the general office of the Association, and copies furnished to each member. He shall also act as Secretary to the Board of Arbitration, and to the several committees hereinbefore provided for, and preserve similar records of their proceedings.

Tenth. The General Commissioner shall be the Chief Executive officer of the Association, and, as the representative of its members, both severally and jointly, shall act for them in all matters which come within the jurisdiction of the Association, in conformity with the requirements of this contract and the instructions of the several committees hereinbefore provided for, but exercising his discretion in all cases which are not provided for either by this general agreement or by the committees acting under its authority and sanction. He shall also, as hereinafter provided, act as a member of the Board of Arbitration in determining all questions which are properly submitted thereto. The General Commissioner shall also take charge of the Green Line car reports and claims, and appoint such clerks and claim agent as may be necessary, and charge up the expense to the roads interested in the Green Line business on an equitable basis; managing the business for the benefit and at the cost of the companies interested.

Eleventh. The Arbitrator and the General Commissioner, acting together, shall constitute a Board of Arbitration, which shall hear and determine all questions which may be submitted to them under this agreement or by consent of the parties members of the Association, and the joint decisions of the said Board of Arbitration shall be final and conclusive; but if there be any difference of opinion between them upon a question submitted for arbitration, they shall agree upon a third disinterested party to act with them in determining such question, and in such case a majority shall decide, and their decision shall be final and conclusive.

Twelfth. The Auditor shall have charge of the Clearing House, and shall keep full and accurate accounts of all the joint traffic, making reports of the same to all members of the Association and to the General Commissioner. He shall keep a ledger account with the General Commissioner and with each member of the Association, from which he shall furnish each company a statement of their account monthly, showing the debits and credits to them at each point at which the business is apportioned, and a general balance-sheet shall be drawn off monthly, and copies furnished to the

Executive Committee and to the General Commissioner, who shall cause settlements of balances to be made promptly, distributing the funds deposited to his credit for this purpose, as hereinafter provided, and drawing drafts on debtor companies for balances due in excess of their deposits as shown by the certified statements of the Auditor, which drafts shall be duly honored, notwithstanding errors or omissions, if there be any, which must be adjusted in subsequent settlements.

Thirteenth. In the event of a vacancy occurring in the office of General Commissioner, Arbitrator, Secretary, or Auditor, the President shall fill the vacancy until a general meeting of the Association can be convened to elect a successor, and such meeting shall be called by the President within 20 days after the vacancy occurs.

Fourteenth. All disbursements of the funds of the Association shall be made by the General Commissioner, who shall give bond, with security in such amount as shall be satisfactory to the Executive Committee, that he will duly and properly account for all moneys of the Association, or belonging to members thereof, which may, in any manner, come into his possession or under his control. No payments shall be made except on vouchers which have been examined, found correct, and certified by the Auditor. Credit shall be given to the General Commissioner by the Auditor, on payments made by him on account of the expenses of the Association or its officers, only on properly receipted vouchers; and such receipted vouchers shall be filed in the Auditor's office, subject to inspection by the Executive Committee, or such person or persons as may be appointed by them for this purpose.

Fifteenth. When all parties interested in the joint traffic at any point are willing to maintain rates without an apportionment of the business, no apportionment shall be required; but if any one of the parties insist upon an apportionment, the question shall be referred to the Board of Arbitration, to determine whether or not such apportionment shall be made; provided, that nothing herein contained shall be construed to require an apportionment of Great Line business.

Sixteenth. On all business apportioned on the basis of revenue, there shall be deducted, as an initial charge, and deposited to the credit of the General Commissioner, by the company which receives the freight, an amount equivalent to 20 per cent. of the revenue to be divided, such deposits to be made in such bank or banks as the General Commissioner shall designate, subject to his order. The amounts so deposited shall be credited by the Auditor to the companies or lines by whom they are contributed, and shall constitute a fund which shall be applied, at the expiration of the month during which the same has been deposited, to the payment of any balances due by such companies; but after settlement of such balances if there be any remainder, it shall be returned to the companies to whom it belongs.

Seventeenth. The Auditor shall be furnished with copies of all manifests issued by companies members of the Association for freights which are shipped from or destined to points at which the business is divided by apportionment, such copies to be forwarded at the time the shipments to which they appertain are made, and abstracts of all such manifests shall be furnished to the Auditor at the expiration of each month. The tonnage books of every company in the Association shall be open at all times to the inspection of the Auditor, or such agents as he may from time to time appoint, for the purpose of enabling him to get a complete record of all freights shipped to or from points at which the business is divided by apportionment.

Eighteenth. In apportioning business, cotton and any other freight which it may be practicable to divide in kind, shall be so divided, and not by allotment of revenue. Each company or line shall be required to carry its allotted proportions as nearly as possible; but settlements must be made for any excess carried, at such period and at such rates per hundred pounds, or per bale, as may be fixed by agreement or arbitration; provided, that no penalty shall be imposed upon a company or line which carries an excess for the benefit of any company or line that refuses or willfully neglects to carry its allotted proportion.

Nineteenth. All divisions by apportionment of tonnage or revenue shall constitute a special agreement between the companies on lines terminating at or passing through the point at which the apportionment is made, and the terms of such agreements shall be adjusted with reference to the circumstances of each case between the parties, or by arbitration, if they cannot agree. The companies to which the allotments are made shall determine the sub-divisions thereof, and shall be responsible for the settlement of all balances for excess carried by them. Companies or lines which carry an excess shall be allowed 20 per cent. of the revenue for transporting the same, when the business is divided on a revenue basis.

Twentieth. When, by reason of any actual difference in the rate or premium for insurance against marine risks, any line is at a disadvantage in competing with any other water, or combined rail-and-water line, such inequality may be obviated by an arrangement with the insurance companies, individually or collectively, by which the transportation lines can assume or pay the difference between the premium or rate of insurance by their own line and that by the lines of their competitors, and thus secure to shippers the same premium or rate of insurance by all lines. In cases of competition between all-rail lines and water or combined rail-and-water lines, the latter may assume the whole of the premiums or rates for insurance against marine risks, and bills of lading to this effect may be issued. It is, however, distinctly understood and agreed that no reduction of the established tariff of rates, rebates, or considerations of any kind shall be given or offered to influence shippers or to secure their preference for any road or line.

Twenty-first. The Executive Committee shall organize such a system for the rendition of tonnage and revenue reports of the joint traffic throughout the territory covered by the Association as shall enable the General Commissioner to be at all times fully informed of the movements thereof, and the observance of rates established therefor, in order that he may detect promptly any violation of rates, and keep the several companies or lines informed as to whether they are in excess or deficit, at such frequent intervals as may be necessary to effect a distribution of the business in accordance with the agreed division thereof, and thus prevent the accumulation of balances in excess of the deposits made to secure the same. For these purposes, committees may be appointed, or joint agencies may be established, by the Executive Committee at their discretion; provided, that such committees shall represent impartially all parties interested, and that nominations of agents shall be made by the General Commissioner; and provided further, that the necessary expenses of all such committees and agencies shall be borne by the Association, and distributed among its members as hereinafter set forth. Tonnage and revenue statements shall be rendered monthly to each member of the Association, and also annually to the 31st day of August, in a report to be made by the General Commissioner and Auditor at the expiration of each year, and distributed to the members at least two weeks before the annual meeting.

Twenty-second. Members of this Association shall not enter into any agreements relative to the joint traffic cov-

ered by this contract with transportation companies not members of this Association, except with the approval of the Executive Committee or the General Commissioner and in accordance with the rules and regulations of the Association as herein set forth, and as supplemented by the Executive Committee as hereinafter authorized or allowed.

Twenty-third. In order to defray expenses of the Association, there shall be assessed annually, on each member thereof, a tax of \$300, which shall be applied to paying salaries of general officers and toward other general expenses, such as office rent, printing, etc.; and such additional amount shall be assessed on the members *pro rata*, according to their gross revenue derived from the joint traffic, as may be necessary to meet these and all other expenses of the Association.

Twenty-fourth. The Executive Committee shall have authority to make, from time to time, such rules and regulations, not inconsistent with this agreement, as may be necessary to secure a systematic conduct of the affairs of the Association and attain the objects for which it is formed.

Twenty-fifth. This contract shall terminate on the 31st day of December, 1888.

Mr. W. G. Raoul moved the adoption of the report as a whole, and the continuation of the Association as therein agreed to. The motion was seconded by Mr. Henry Fink.

Upon objections being made to the adoption of Section 20, on a vote to adopt as a whole, a vote was first taken by unanimous consent on the adoption of Section 20, resulting in its adoption. Upon the announcement of this vote the representatives of several steamship lines requested to be recorded as dissenting to Section 20, viz., Mr. Groner, for Merchants & Miners Transportation Co.; Mr. Stanford, for Old Dominion Steamship Co.; Mr. Eger, for the Clyde Steamship Lines; Mr. Hasell, for the New York & Charleston Steamship Co., and Mr. Poor, for Baltimore Steam Packet Co.

Upon a vote being had on the adoption of the report as a whole, it was adopted unanimously.

Hon. R. R. Bridgers, Chairman, stated that the Committee had also prepared a report in reference to the salaries of officers, and nominations for same, and the location of the office of General Commissioner, which, being stated by sections, was put to a vote separately and acted on as follows:

1st. That the salaries of the General Commissioner and of the Secretary remain as now. Adopted.

2d. That the salary of the Arbitrator be \$2,500 per annum. Adopted.

3d. That the salary of the Auditor be \$2,500 per annum. Adopted.

The nominations were then made and voted on separately, as follows—each party named being unanimously elected:

President, Hon. Joseph E. Brown; General Commissioner, Virgil Powers; Secretary, Charles A. Sindall; Arbitrator, Thomas H. Carter; Auditor, Thomas E. Walker.

The report in reference to location of the office of General Commissioner, viz., "That the office of the General Commissioner be removed to, and established at, Atlanta, Ga.," was then adopted.

Mr. Raoul moved that the present Rate Committee be continued in office until the Executive Committee can organize and act on the appointment of the same. Carried.

Mr. Smith moved that the Executive Committee called for by the agreement just adopted be named, and that it meet and organize. Carried.

Upon the call of lines, the following Executive Committee was named: Virginia, Tennessee & Georgia Air Line, Henry Fink; Richmond & Danville Line, T. M. R. Talcott; Great Southern Freight Line via Savannah, W. G. Raoul; Great Southern Freight Line via Charleston, John B. Peck; Louisville & Nashville Line, M. H. Smith; Cincinnati, New Orleans & Texas Pacific Line, John Scott; Savannah, Florida & Western Line, H. S. Haines; Western & Atlantic Railroad Co., R. A. Anderson; Atlantic Coast Line, Hon. R. R. Bridgers; Nashville, Chattanooga & St. Louis Railway, J. W. Thomas; Coastwise Steamship Association (to be named hereafter).

Mr. Powers, General Commissioner, requested that the office of General Commissioner be allowed to remain at Macon until April 1, which was granted by unanimous consent.

Mr. Smith moved that the appointment of Mr. Thomas E. Walker as Auditor take effect also from April 1, and that in the meantime the work of the Clearing-House be done under direction of the General Commissioner. Carried.

On motion it was ordered that the agreement be prepared by the Secretary for signatures as quickly as possible.

Mr. Groner moved that if any company, a member as per agreement, is not represented at 9 o'clock p. m., that the original agreement be sent to the chief executive officer of said company to have it signed, etc. Carried.

On motion of Mr. Fink, the Convention took a recess.

Upon the reassembling of the Convention the contract of agreement was read by the Secretary, and the signature of all members present affixed in order.

On motion, the thanks of the Convention were returned to the proprietors of the Metropolitan Hotel for courtesies extended, etc.

The General Commissioner announced that during the recess of the Convention the Executive Committee had held a meeting and had reappointed for 1888 the present Rate Committee.

On motion, the Convention adjourned *sine die*.

Old and New Locomotives.

In his recent inaugural address as president of the Institution of Engineers and Shipbuilders in Scotland, Mr. J. Reid gave some interesting notes on locomotives. The first engines of the old Garnkirk & Glasgow Railway, which was opened about the year 1829, weighed from 8 to 9 tons. They had 11-in. cylinders, and wheels of cast-iron 4 ft. in diameter with a working pressure in the boiler of 50 lbs. per square inch. The Garnkirk engine used to take a train of three carriages, weighing 7 tons gross, at an average speed of 16 miles per hour, between Glasgow and Gartsherrie. When the old line, eight miles in length, was merged in the Caledonian Railway, now comprising a system of about 870 miles, the power of the engines was greatly increased, and at this day there are express passenger engines working over the same ground having 17-in. and 18-in. cylinders, and wheels of 7 ft. and 8 ft. in diameter, and weighing, in working order, from 35 to 45 tons. These engines take a gross load of 90 tons at a speed of from 40 to 50 miles per hour, burning about 23 lbs. of coal per mile run.

ANNUAL REPORTS.

Page.	Page.
Atchafalpa, Topeka & Santa Fe..... 7	Long Island..... 73
Boston, Barre & Gardner..... 73	Maine Central..... 73
Boston & Lowell..... 23	New Haven & Northampton..... 7
Boston, Revere Beach & Lynn..... 109	N. Y. Cen. & Hudson River..... 7
Charlotte, Col. & Augusta..... 23	N. Y., New Haven & Hartford..... 32
Chicago, Bar. & Quincy..... 7	Pennsylvania & N. Y..... 73
Chi., Milwaukee & St. Paul..... 73	Philadelphia & Reading..... 32
Cincinnati, N. O. & Texas Pac..... 39	Pittsburgh & Lake Erie..... 40
Cleveland & Pittsburgh..... 39	Portland & Ogdensburg..... 100
Columbia & Greenville..... 59	Portland & Rochester..... 100

Delaware & Hudson Canal..... 100	Rochester & Pittsburgh..... 41
European & North American..... 32	South Carolina..... 39
Fitchburg..... 40	Virginia Midland..... 109
Grand Trunk..... 59	Western R. R. Association..... 27
Hartford & Conn. Western..... 7	Woodstock..... 100
Houston & Texas Central..... 39	Worcester & Nashua..... 40
Lehigh Valley..... 73	

Providence & Worcester.

This company owns a line from Providence, R. I. to Worcester, Mass., 43.41 miles, and the East Providence Branch, 7 miles. It leases the Milford & Woonsocket road, 3.88 miles, and the Hopkinton road, 11.55 miles, making 50.41 miles owned and 65.84 miles worked. The report is for the year ending Sept. 30.

The equipment consists of 34 locomotives, 47 passenger-train cars and 1,639 freight cars.

The general account is as follows:

Stock.....	\$2,500,000.00
Bonds.....	1,242,000.00
Notes payable.....	420,000.00
Accounts and balances.....	39,771.21
Profit and loss.....	358,411.33
Total.....	\$4,560,182.54
Road and equipment.....	\$4,028,532.36
Materials.....	159,966.94
Accounts and balances.....	31,732.45
Cash.....	341,950.79
Total.....	4,560,182.54

There was no change in stock, bonds or notes payable during the year. The bonds are all of one issue, bearing 7 per cent. interest, making the interest charge \$86,940 yearly.

The earnings for the year were as follows:

	1881-82.	1880-81.	Inc. or Dec.	P. c.
Freight.....	\$895,993	\$821,667	I.	\$74,326 11.9
Passengers.....	424,355	392,446	I.	31,909 9.1
Mail, etc.....	27,167	25,558	I.	1,609 6.2
Total.....	\$1,347,515	\$1,039,671	I.	\$307,844 10.4
Expenses.....	855,097	734,306	I.	121,391 16.5
Net earnings.....	\$291,818	\$305,365	D.	\$13,547 4.4
Gross earn. per mile.....	17,429	15,791	I.	1,638 10.4
Net " " ".....	4,432	4,638	D.	206 4.4
Per cent. of exp's.....	74.6	70.6	I.	4.0

The earnings were the largest ever reported by this road, in spite of a general reduction of passenger and freight rates.

Rentals amounting to \$19,080 in each year are included in expenses.

The income account was as follows:

Net income for the year.....	\$291,817.66
Decrease in cash and materials on hand.....	148,835.49
Increase in unpaid dividends.....	1,290.00
Total.....	\$441,943.15

Balance of interest account..... \$87,058.08

Dividends, 6 per cent..... 150,000.00

New locomotives..... 199,961.47

New cars..... 31,000.00

New cars..... 63,923.60

Total..... 441,943.15

The balance of interest account and the dividends paid amounted to \$237,058.08, or \$54,759.58 less than the net earnings for the year. The new construction included second track, new shops and the purchase of land.

The traffic for the year was as follows:

	1881-82.	1880-81.	Inc. or Dec.	P. c.
Train mileage.....	305,657	286,157	I.	19,500 6.8
Freight cars.....	271,525	252,462	I.	19,063 7.6
Service and switching.....	234,125	205,164	I.	28,961 14.0
Total.....	811,307	743,783	I.	67,524 9.1
Car mileage.....	982,135	1,117,905	I.	17,905 12.0
Passenger train cars.....	4,351,208	4,353,896	I.	27,322 0.6
Freight cars.....	2,335,823	2,016,513	I.	319,310 15.8
Passengers carried.....	19,977,254	17,439,429	I.	2,537,725 14.5
Tons freight carried.....	882,133	771,729	I.	110,354 14.3
Ton-miles.....	25,023,982	22,211,710	I.	2,812,272 12.7
Av. train load.....	65	61	I.	4 6.5
Passengers, No.....	92	88	I.	4 4.5
Freight, tons.....	2.78	2.80	D.	0.02 " 0.7
Per pass.-mile.....	2.12 cts.	2.24 cts.	D.	0.12 ct. 5.3
Per ton-mile.....	2.78	2.80	D.	0.02 " 0.7

The average rate for through passengers was 2.60 cents; for local, 2.15 cents, and for season-ticket passengers 0.661 cent per mile. The average rate on through freight was 2.206 cents and on local 3.03 cents per ton-mile.

The double track has been completed with the exception of two short sections where new bridges are to be built. There have been also 2.16 miles sidings built. There were used in renewals 1,006 tons steel rails and 56,000 ties. Only 2½ miles of the main track are now laid with iron. Three locomotives, 6 passenger and 50 freight cars were added to the equipment, beside 2 engines and 47 freight cars built to replace old ones.

The road from Providence to Boston Switch has been equipped with electric signals by the Union Electric Switch & Signal Co. Signals of the same system have been put in use at several other stations and grade crossings.

Six new iron bridges were built and two brick station houses were finished, and a third one begun.

St. Paul & Duluth.

This company owns a main line from St. Paul, Minn., to Duluth, 156 miles, and the Knife Falls Branch, 6 miles. It leases the Stillwater & St. Paul road, from White Bear to Stillwater, 13 miles, and the St. Paul, Stillwater & Taylor's Falls, from Wyoming to Taylor's Falls, 21 miles, making 196 miles in all. The main line for 24 miles from Duluth is owned and used in common with the Northern Pacific. The following statements are for the year ending Dec. 31 last.

The general account is as follows:

Common stock and scrip.....	\$4,055,407.51
Preferred stock and scrip.....	5,158,767.60
Funded debt.....	1,000,000.00
Equipment trust.....	66,543.42
Accounts and balances.....	349,539.57
Income account, surplus.....	610,910.33
Total.....	\$11,241,168.43
Road and equipment.....	\$9,887,167.10
Land contracts.....	305,074.19
Stocks and bonds.....	202,639.90
Materials.....	214,395.97
Accounts and balances.....	109,596.73
Cash.....	362,294.54
Total.....	11,241,168.43

The bonded debt consists of one issue of first-mortgage bonds, bearing 5 per cent. interest, the annual charge being \$50,000.

The earnings for the year were as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Earnings.....	\$1,109,840	\$732,630	I.	\$377,210 51.5
Expenses.....	798,594	566,131	I.	232,463 41.1
Net earnings.....	\$311,246	\$166,499	I.	\$144,747 86.9
Gross earn. per mile.....	5,602	3,738	I.	1,864 51.5
Net " " ".....	1,588	850	I.	738 86.9
Per cent. of exp's.....	72.0	77.2	D.	5.2

Expenses include all renewals and betterments of road not coming strictly under the head of new construction.

LOCOMOTIVE RETURNS, SEPTEMBER, 1882.

Master Mechanics of all American railroads are invited to send us their monthly returns for this table.

NAME OF ROAD.	Miles operated.	MILEAGE.		MILES RUN TO		AVERAGE TRAIN.		COST IN CENTS PER		COST PER MILE IN CENTS FOR		AVERAGE COST OF	
		Total.	Average per engine.	Coal.	Oil.	Passenger cars.	Loaded freight cars.	Passenger car mile.	Freight car mile.	Locomotive.	Freight car.	Coal, per ton.	Wood, per cord.
Allegheny Valley:													
River Div.	180	39	84,314	2,219	30.11	18.97	3.00	24.50	5,122	0.683	5.06	4.64	0.65
Low Grade Div.	120	23	47,830	2,080	30.70	20.00	2.90	22.50	2,763	1.173	7.70	4.10	0.70
Buffalo, Pitts. & Western.	223	26	60,030	2,635	39.36	21.25	3.00	13.00	2,753	1.552	5.01	4.10	0.52
Central Pacific:													
Western Div.	300	30	75,440	2,531	50.50	12.90	...	...	...	...	8.73	12.07	0.70
Northern & San Pablo Div.	104	36	96,571	2,683	35.14	14.94	...	...	...	...	5.51	18.94	0.60
California Pacific.	179	15	41,596	2,773	43.77	23.28	...	...	...	...	6.28	15.24	0.42
Sacramento Div.	119	11	104,051	2,535	...	19.37	...	...	...	...	3.08	18.23	0.48
Truckee Div.	205	31	81,430	2,627	30.49	90.93	17.91	...	...	...	6.32	20.58	0.49
Humboldt Div.	209	21	59,957	2,855	38.44	20.91	...	...	...	...	5.86	17.33	0.44
Salt Lake Div.	219	32	93,020	2,907	32.45	16.84	...	...	...	...	7.08	20.52	0.53
Oregon Div.	151	14	28,334	2,853	...	21.47	...	...	...	...	1.78	13.05	0.44
Stockton & Copperopolis.	49	3	1,296	1.76	...	16.61	...	...	...	...	3.10	8.25	0.45
Visalia Div.	157	19	43,892	2,509	35.49	19.40	...	...	...	...	6.88	21.33	0.45
Tulare Div.	170	25	58,561	2,334	29.28	15.14	...	...	...	...	6.43	30.21	0.61
Los Angeles, Sac. Diego & Wilm. Div.	167	28	75,340	2,898	39.26	13.01	...	...	...	...	2.31	22.59	0.71
Yuma Div.	249	28	58,554	3,156	43.24	14.20	...	...	...	...	3.08	21.00	0.64
Gila Div.	248	23	76,988	3,347	49.69	16.18	...	...	...	...	6.11	17.90	0.56
Tucson Div.	219	20	81,035	2,701	34.95	15.39	...	...	...	...	3.25	25.38	0.61
El Paso & Rio Grande Div.	446	34	103,016	2,690	51.22	18.27	...	...	...	...	1.73	17.39	0.47
Chicago & Eastern Illinois:													
Main Line.	172	56	123,325	2,735	29.20	16.40	...	...	...	...	2.04	4.63	0.44
Terre Haute Div.	53	3	29,841	32.40	...	16.40	...	...	...	...	1.59	4.35	0.42
Bela, Laoka, & Western.	80	20	83,090	2,873	...	27.46	...	...	...	...	2.00	...	0.57
Grand Rapids & Ind.	332	34	154,411	2,859	35.88	16.50	4.40	15.30	3,027	1.506	3.14	8.74	0.56
Main Line.	332	34	154,411	2,859	35.88	16.50	4.40	15.30	3,027	1.506	3.14	8.74	0.56
Ch. Rich. & Ft. Wayne.	332	34	154,411	2,859	35.88	16.50	4.40	15.30	3,027	1.506	3.14	8.74	0.56
G. R., Ind. & Mackinaw.	34	11	7,943	7.22	66.62	14.90	4.60	3.40	6,435	5.995	1.01	7.94	0.63
Bay View, L. Tr. & Mack.	8	2	2,436	1,218	50.80	14.00	1.60	...	6,444	...	1.00	5.77	0.64
Traverse City.	26	3	4,276	1,425	25.00	84.50	12.80	2.40	1,908	1.086	1.15	5.04	0.73
Allegan & Southwestern.	12	1	1,120	1,120	...	56.00	38.00	4.20	3,948	...	0.13	4.46	0.58
Illinois Central:													
Chicago Div.	365	107	285,431	2,607	33.49	15.06	5.11	22.90	...	...	4.37	5.14	0.27
St. Louis Div.	101	19	22,894	1,174	38.54	19.50	1.87	16.81	...	...	1.31	4.39	0.22
North Div.	345	53	111,341	2,967	32.34	13.53	3.92	14.10	...	...	6.85	9.69	0.31
Springfield Div.	113	12	37,664	1,139	36.22	18.91	1.70	13.20	...	...	1.08	4.58	0.28
Iowa Div.	401	46	124,203	2,700	30.16	18.18	4.55	13.50	...	...	3.15	8.38	0.24
Jeff. Madison & Indianap.	220	43	120,297	2,798	35.69	15.65	3.49	20.10	4,640	1.110	2.95	10.20	0.40
Kan. City, St. L. & Coun. Bl.	247	42	194,971	3,214	42.30	32.00	3.90	31.50	...	...	4.50	5.30	0.30
Lake Shore & Mich. Southern:													
Buffalo Div.	87	203,545	2,339	37.16	...	25.62	...	...	...	...	3.12	7.17	0.26
Erie Div.	138	138	310,010	2,428	32.83	39.94	...	...	...	...	4.63	7.11	0.27
Toledo Div.	93	93	212,560	2,226	30.62	39.84	...	...	...	...	3.03	8.59	0.31
Mich. Southern Div.	239	644,770	2,378	37.88	85.38	23.83	...	...	...	...	4.10	5.27	0.26
Little R. Miss. Riv. & Texas.	172	14	25,373	1,812	...	69.00	9.00	...	...	...	4.07	4.09	0.47
Louisville & Nashville:													
First Div.	435	62	158,973	2,364	32.00	12.07	5.12	17.02	2,740	1.250	2.44	6.30	0.41
Second Div.	200	25	70,776	2,831	33.67	16.84	4.22	16.46	2,790	1.130	4.39	5.22	0.28
Memphis Div.	139	14	45,897	3,276	36.1	15.44	4.28	11.55	3,110	1.500	3.36	5.54	0.32
Nash. & Decatur Div.	122	28	61,098	2,321	32.59	12.85	3.06	15.95	4,410	1,040	3.64	4.77	0.40
South & North Ala.	136	38	111,673	2,969	30.96	16.33	3.79	13.40	4,440	1,440	4.38	8.75	0.36
Mobile & Montgomery.	180	28	69,750	2,491	49.09	16.00	5.53	17.45	2,300	1,020	8.25	5.08	0.28
St. Louis Div.	207	33	76,947	2,332	40.68	14.60	3.30	13.64	3,010	1,210	3.43	3.10	0.32
Evans, Hen. & Nash. Div.	135	40	99,018	2,475	30.57	15.41	3.28	12.61	4,310	1,490	5.52	4.37	0.28
New Orleans Div.	141	24	36,082	2,733	41.80	15.40	5.83	23.62	3,130	980	3.08	6.94	0.32
Pensacola & Selma Div.	134	20	14,826	741	55.51	13.15	...	...	...	...	4.32	4.32	0.42
Louisv., Cin. & Lexington.	223	44	127,957	2,908	37.11	14.15	4.86	12.49	3,000	1,460	2.16	5.90	0.38
Marquette, Hough, & Ont.	96	32	76,908	2,403	38.91	29.85	...	...	...	...	0.98	10.52	0.43
New York, Penna. & Ohio:													
Eastern Div.	225	78	260,706	3,420	33.46	14.44	6.60	22.00	...	...	3.40	5.64	0.54
Western Div.	197	63	202,492	3,214	25.21	2.27	7.40	19.00	...	...	4.63	7.10	0.40
Mahoning Div.	141	55	157,805	2,860	37.08	18.06	4.30	22.80	...	...	3.14	4.67	0.43
Northern Central:													
Elmira & Canandaigua Divs	147	...	...	...	...	...	...	...	...	...	...	...	...
Ohio Central.	231	44	147,598	3,364	34.80	17.72	...	...	...	...	2.15	2.78	0.38
Pennsylvania, United N. J.:													
New York Div.	120	153	493,908	3,229	31.21	8.28	5.40	24.00	...	...	...	...	...
Amboy Div.	214	54	121,018	2,297	43.15	12.16	3.00	12.70	...	...	...	...	...
Belvidere Div.	80	40	83,006	2,075	29.59	10.04	3.30	23.90	...	...	...	...	...
Pennsylvania, Penna. R. R.:													
Philadelphia Div.	306	193	564,690	3,920	26.04	10.35	5.02	27.84	...	...	...	...	...
Altoona Div.	132	40	314,650	3,167	22.26	13.20	6.95	44.83	...	...	...	...	...
Midvale Div.	56	27	50,885	1,885	37.45	14.45	2.49	12.57	...	...	...	...	...
Pittsburgh Div.	172	147	554,035	3,812	26.25	10.91	5.87	16.10	...	...	...	...	...
Tyrone Div.	142	44	108,472	2,420	14.67	18.12	2.83	9.68	...	...	...	...	...
West Penn. Div.	104	21	47,396	2,251	35.81	27.17	2.99	16.09	...	...	...	...	...
Lewistown Div.	63	11	22,982	2,060	25.16	14.70	1.87	12.48	...	...	...	...	...
Bedford Div.	57	15	14,639	2,932	27.65	23.70	...	...	...	...	...	...	...
Frederick Div.	106	12	27,252	2,271	33.29	18.12	...	...	...	...	...	...	...
Monongahela Div.	54	14	20,007	2,144	39.97	17.92	3.93	15.05	...	...	...	...	...
Phila., Wm. & Baltimore:													
Maryland Div.	98	75	293,170	3,169	39.97	9.28	...	...	...	...	...	...	...
Central Div.	182	18	46,259	2,968	34.76	9.43	...	...	...	...	...	...	...
Delaware Div.	97	27	66,368	2,569	42.10	9.09	...	...	...	...	...	...	...
Pitts., Cin. & St. Louis:													
Little Miami Div.	197	39	145,057	3,709	39.60	12.61	4.96	18.10	2,130	1,063	3.89	5.09	0.58
P. C. & St. L. Div.	247	104	316,094	3,130	37.94	17.19	5.00	17.55	2,850	950	6.78	3.74	0.57
West Jersey.	164	31	83,818	2,704	33.25	23.26	4.17	12.91	...	...	...	...	...

* Five empty cars rated as three loaded ones.
 † Switching engines allowed 6 miles per hour; helping engines, actual distance run.
 ‡ Switching engines allowed 6 miles per hour.
 § Fuel not estimated.
 ¶ Two empty cars rated as one loaded one.

The increase both in gross and net earnings was very large. The income account was as follows:

Net earnings of road	\$311,244.39
Land department receipts	227,597.15
Total	\$538,841.54
Interest on bonds	\$50,000.00
Dividends, preferred stock	358,641.50
	408,641.50

Surplus for the year	\$130,202.04
Surplus, Jan. 1, 1882	175,634.10
Balance of deferred income (land contracts)	305,074.19
Total surplus, Jan. 1, 1883	\$610,910.33

During the year there was expended for new construction, new equipment and additions to property \$251,198.83. These expenditures were met from surplus earnings and proceeds of bonds sold.

Ohio & Mississippi.

This road includes a main line from Cincinnati to East St. Louis, 338 miles; a branch from North Vernon to Louisville, 53 miles, and the Springfield Division, from Beardstown, Ill., to Shawneetown, 225 miles, making 616 miles in all. The road is in possession of John M. Douglass, Receiver, and the following statements are from a report made by him to the Court for the period from Oct. 7, 1881, the date of his appointment (to succeed John King, Jr.), to Dec. 31, 1882.

The report says: "The preceding summer (1881) upon the line of this road had been one of great drought and heat. Not only had the harvest failed, so that the country along the railway was destitute of wheat and corn, but, in the parched condition of the land, fires had swept away fences, orchards and meadows, and claims for damages were pending against the company on account of fires set by engines. These claims were, on some parts of the line, large in number and amount, and as we were liable for damages arising in this way, large sums of money were expended in settlement of them.

"Our gross earnings were diminished by the failure of our staple crops, and our operating expenses increased by the payment of these claims, both arising from the unprecedented drought along our line.

"In the month of November, 1881, we purchased on credit 15 new passenger coaches, at \$5,000 each, and three new postal cars, at \$3,800 each. We purchased also 100 new

coal cars, at \$512.50 each. These cars were all delivered and paid for and the amount charged in expenses of the early part of 1882.

"The disastrous floods of February, 1882, in the Ohio and other streams along our line, caused us damages which I estimate at about \$40,000, in addition to the loss of traffic, which was large."

The gross and net earnings for the period of 15 months were as follows:

	Gross.	Net.
October, 1881	\$363,321	\$114,874
November	338,000	72,774



Published Every Friday.

CONDUCTED BY
S. WRIGHT DUNNING AND M. N. FORNEY.

EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subject pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

INVENTIONS AND PATENTS.

Probably the number of people who entertain doubts or who are entire disbelievers in the benefit to the public of our patent system has increased during the last ten or twenty years. That the system has some serious evils connected with it there can be little doubt, but its advantages, like many other blessings, are apt not to be appreciated, whereas the attending evils are magnified.

The theory of the patent system is set forth as follows in Kent's "Commentaries on American Law":

"It has been found necessary for the promotion of the useful arts and the encouragement of learning, that ingenious men should be stimulated to the most active exertion of the powers of genius in the production of works useful to the country and instructive to mankind, by the hope of profit, as well as by the love of fame or a sense of duty. It is just that they should enjoy the pecuniary profits resulting from mental as well as bodily labor."

It must be noticed, though, that the theory of the patent system is not, as it is so often represented to be, a recognition, by the law, of the rights of an inventor to the profits resulting from his invention. The patent law does not give any right to an inventor to his ideas excepting under certain conditions. One of these conditions is that he shall be the first discoverer of the new thing. If there happen to be two inventors whose attention is directed to the same subject, they may each devote the same amount of time, labor and money to experiment, investigation and research, and yet if one of them makes and describes the invention one day or one hour before the other, and can prove it, a patent will be granted to the man who was first. In other words, as has been pointed out in these columns before, the element of *priority* is essential to the recognition of an inventor's right to the results of his mental labor.

What the law, in substance, says to the community is, that certain rights and privileges will be given to whoever first discovers any new and useful art, machine, manufacture or composition of matter. A second discoverer, and there are many such, has no rights or privileges which the patent law recognizes. It is as though the government should say to the people, Whoever first discovers a mine of valuable minerals in the public lands shall have the right, for a limited time, to work it for his exclusive benefit. Now it might happen, if such were the case, that a person would devote much time and labor in searching for minerals and yet fail in finding them, while another would accidentally make the discovery and thus have all the rights of working the mine conferred on him.

Patents are in fact premiums offered by the government to stimulate invention and discovery. The question which will be considered in this article is whether

it is to the interest of railroad companies and through them of the community that prizes should be offered for new inventions, and to consider what would probably be the result if the patent laws were abolished and the privileges which are now conferred on first inventors were entirely withheld.

Any one who has studied the traits essential to the material progress and advancement of a people will recognize that one, which is a distinctive trait of the people in this country and England, the two nations which have developed most rapidly, is what has been called "an eager foresightedness," which advances human knowledge and discovery in every direction that seems possible. To quote from a little book on the "Nature of Intellectual Property," by N. S. Shaler:

"It is not too much to say that it is to the development of this spirit that society must look for all future material advances on its difficult way. Whatever serves to increase this element in any society adds to the rate at which it gains on the difficulties which beset its advance; whatever retards the development of such a spirit is so much gain in the forms of inaction."

Among some races the inventive spirit seems to be almost entirely absent, and among them material progress is almost at a stand-still. It is perhaps impossible to know to what extent this spirit of discovery has been developed by the patent systems of this country and England, but whether the system is a cause or an effect, it is noticeable that in countries where there has been much invention, or advance in the arts, there has also been a liberal system of patent law.

To what extent a government can foster traits of character in its subjects is too big a question to be considered here; but the nation which gives rewards and honors for military distinction becomes warlike; men—and women too—devote their time and thought to the study of art or literature where these confer distinction. Here and in England there have been many instances in which the rewards given to mechanical skill have been "as brilliant in appearance as the marshal's bâton which waved in the air before the recruits of the grand army." Prizes of this description which are held out by our patent system, and for which all men may contend, have the effect of stimulating the inventive and investigating faculty to the extent to which such prizes are valued. The giving of property in invention is practically a method of repayment of public benefit in a better defined way than by governmental prizes or pensions.

But it is often said that the ordinary stimulus of competition in trade would, of itself, lead to invention. This argument is used oftentimes by those manufacturers who have not made inventions and improvements, and find themselves at a disadvantage because others have. The fact is, as pointed out by Mr. Shaler in his book already quoted from, the ordinary vocations of business life not only do not develop the capacity and appetite for continuous and thoroughly intent mental labor, which is so essential in invention, but "they all lead away from such a result. Considered from the point of view of training, the worst thing that can be said of an ordinary business-life is that it is almost necessarily desultory, and does not require, in fact scarcely admits, the least degree of intense connected thought. Its methods are foreign to the investigative spirit on which depends all the advances in human knowledge."

It is not surprising, then, that men whose training and intellectual habits are all of a commercial type often manifest some hostility to the patent system. The effort which has recently been made in Congress to throw open the recently discovered processes for manufacturing steel to all who choose to use them, without the consent of the owners of the patents, is a manifestation of this spirit. It is said that the people who have not wit enough to make puns always object to them. In the same way it is true that those who have not the kind of ability required for invention object to the monopolies granted to those who have. That this opposition to patents is not unknown among railroad managers any one who has considerable intercourse with them will learn. In fact there are men in such positions who go to the extent of prohibiting the use of all patented inventions on the roads which they control, or of doing so to the extent that is possible.

A question which is worth serious consideration is whether inventors would invent if there were no patents. It of course would be great folly to say that all discovery is due to the stimulus which is given to it by patent laws.

Knowledge is so fascinating to many minds that its pursuit would not be abandoned even if its acquisition brought no pecuniary benefits. But perhaps few people realize to what an extent our material development is stimulated by the patent system. Let any one go over the *Patent Office Journal*, week after week, and see the innumerable subjects to which in-

numerable people are devoting their attention and study, and it will be plain that any system which stimulates intellectual effort to the extent that our patent laws do must result in very great usefulness to the community.

Their influence, though, is not entirely for good. Unfortunately the effect which the great prizes conferred by patents, and which can be competed for by all, has in some minds is very similar to that of gambling. The vision of success and wealth is before the eyes of many inventors constantly, and seems so near and yet is so far from realization that it is no wonder that a person having what may be called an illogical inventive imagination loses the thread of cause and effect which is woven through all the texture of life and human experience. Unfortunately, vast numbers of persons enter the field of invention who have none of the qualifications which they must have to be successful, excepting what may be called mechanical imagination. They are able to conjure up images of mechanical contrivances, which they mistake for adaptation of means for the accomplishment of ends. There is a distinct form of mental aberration, which results from or attends the exercise of a certain order of invention. Often this is extremely pitiable. Then, too, there is the dismal bore who assumes the form of an inventor, who haunts the offices of railroads and technical papers. There ought to be an asylum for these people in which their hallucination could be dispelled. They have an argument which they consider irrefutable. They say people disbelieved and ridiculed Watt's and Stephenson's inventions; they have no faith in my invention and laugh at it. Watt and Stephenson were ridiculed and succeeded; I am ridiculed, therefore I will succeed. Neither common sense, nor logic nor experience will prevail against this reasoning. As Mr. Shaler says: "The mass of our inventors have to fight their way through a perfect jungle of ignorance to achieve these results." The enormous waste of human thought and effort which is recorded in the Patent Office is, like the history of the cruelty to and suffering of mankind, a heritage of woe which we cannot contemplate without shuddering.

Still it must be kept in mind that "the mass of men of any generation are born to an instinctive acceptance of things as they are: it is rare that men are awakened to a struggle with the evils of their environment." Whatever does so awaken them is an advantage. There is nothing so hopeless as stagnation. It is certain that the patent system has a powerful influence in preventing it.

Any one who is familiar with the history of any important inventions made in recent years, must see that without the stimulus of the patent system their development would have been certainly much slower and would have been delayed for centuries, possibly, had it not been for the stimulus offered by the patent laws. Take as an example the Westinghouse brake. For years there was a flood of inventions in that direction. Experiment after experiment was made, and all conceivable kinds of means were employed and abandoned. When Mr. Westinghouse entered the field he was compelled to begin by experimenting and investigating. Almost his first step was to learn what is required of a continuous brake. His invention in the beginning was crude, and was improved slowly. It was not created complete and perfect, but was developed by tentative processes.

After that it was necessary for him and his company to educate the whole railroad community up to an understanding of its advantages. Without the rights and privileges which the patent laws conferred, the invention would probably have been abandoned long before it was perfected. The same thing is true of nearly all other important inventions. If inventors had no right to the use of their discoveries, there would be no sufficient object to induce them to devote their time, thought, labor and money to the discovery of new and improved methods of doing things.

It should be observed, too, that nearly all successful inventions have been dependent upon experiment for their development and perfection. Without the chance to test his ideas in actual practice, most inventors are helpless. Nearly all discoveries are as much or more the result of experiment as of the original mental conception.

The conclusion aimed at and the deduction which it was the purpose of this article to make clear must, on account of the length of the article, be stated abruptly. It is that the patent system results in distinct advantage to railroads and their owners, and through them to the community, and that a just and generous recognition of the rights of inventors conferred by the patent laws is to the true interest of railroad companies, and lastly that some way should always be kept open by which promising and meritorious inventions can be experimented with.

TRAIN ACCIDENTS IN 1882.

The report of train accidents in December last which we published last week completed the tenth year of our record, and we here, as usual, review the record of the year and of the ten years, with a view to presenting the chief causes of the accidents, the variations in the numbers occurring from each principal cause from year to year, the fatalities accompanying them, etc.

First we premise that this is a record of accidents to trains only, and not a record of all railroad accidents. By far the larger number of persons killed and injured on railroads are hurt either while standing, walking or working on the tracks, on getting on, getting off or falling from trains in motion, and without any accident to the trains which hurt them, most of these being employes and trespassers. For instance, on the New York, Lake Erie & Western Railroad in the year ending with September, 1880, of 115 persons killed and 810 injured on the road only two of the killed and four of the injured were victims of accidents to trains. But these other accidents were in large part due to causes different from those which result in train accidents, and it is utterly impossible for us to make a record of them; nothing but public authority can do that.

Our information of train accidents is obtained chiefly from the newspapers, from all parts of the country, searched for the purpose. These chronicle nearly all the accidents causing death or serious injury, and most of those which do much damage to rolling stock or cause serious delay to trains; the derailments without much damage are scarcely ever reported, and many rear collisions of the same character escape notice altogether; and doubtless there are several times as many of these as the accidents which are reported. But as those which we get track of are the more serious accidents, and as they have been obtained in the same way and are apparently equally complete in the different years, they form a trustworthy basis for studying the causes of accidents.

Accidents vary in frequency with the season and the weather. For this reason we give the number of accidents chronicled each month for the ten years:

Number of Train Accidents Each Month for Ten Years.

	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.
January.....	174	106	131	61	147	75	113	62	23	137
February.....	133	90	211	91	66	67	88	64	149	80
March.....	112	78	122	119	78	49	61	65	113	90
April.....	104	59	67	60	69	46	50	71	63	81
May.....	79	59	64	61	49	50	37	49	85	91
June.....	91	83	61	79	49	56	64	56	73	72
July.....	90	64	73	79	53	54	81	78	102	92
August.....	150	73	114	78	94	75	79	112	170	139
September.....	116	89	116	106	78	78	124	144	153	153
October.....	88	81	83	103	82	61	104	130	131	136
November.....	76	82	87	96	83	68	86	145	133	125
December.....	89	74	64	88	66	63	69	135	113	148
Total.....	1,258	980	1,201	982	891	740	910	1,078	1,408	1,365

In considering the total number of accidents in the year we should remember the growth of the railroad system. The miles in operation at the end of 1873 were about 70,000; at the end of 1877, 80,500; at the end of 1882, probably 112,000. Accidents are not likely to be in proportion to mileage, as the difficulty of working increases immensely with the density and especially with the complexity of the traffic—number of junctions, crossings, etc.—and also with the condition of road and equipment. But some increase in accidents is to be expected with additional roads with the simplest traffic, and at times there has been great increase in the train mileage and complexity of traffic on the older roads. We find that, *per thousand miles of road*, there were 18.3 accidents in 1873, only 9.2 in 1878, 14.3 in 1881 and 12.2 in 1882. In 1873 a very large proportion of the roads were new and badly constructed. There was a great and general improvement for several years afterward, without much addition of new road. Since 1878 about 40 per cent. has been added to the mileage of the country, which in construction has been much superior to that built before 1874. The new road, it should be said, though generally inferior in character to the old, has usually a much smaller and simpler traffic, and the accidents ought not to be as numerous, in proportion to mileage, as on the older and better roads.

There are two periods of the year when accidents are likely to be numerous—the first quarter of the year, and the three months August, September and October. Only in very mild winters has the number of accidents in the first quarter of the year been as little as quarter of the accidents of the year, though it is a time of light traffic usually; in three severe winters a third or more of the accidents of the year have happened in this quarter. The causes of the numerous accidents in August or September are more obscure. An examination of the above table will show what a sudden and great increase there is in almost every year from July to August. In the months in question there is usually activity in both passenger and freight traffic, many excursions and other irregular trains, and thus the con-

TRAIN ACCIDENTS—THEIR NATURE AND CAUSES, FOR TEN YEARS.

	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.
COLLISIONS:										
Rear.....	388	306	274	206	142	150	150	141	131	187
Butting.....	160	146	141	86	70	96	94	104	87	102
Crossing.....	30	24	22	17	7	13	15	18	19	31
Unknown.....	3	1	1	1	1	1	1	1	1	1
Passing.....	3	1	1	1	1	1	1	1	1	1
Total collisions.....	581	536	437	310	220	268	279	278	260	392
DERAILMENTS:										
Broken rail.....	37	85	45	56	17	46	50	107	42	111
Loose or spread rail.....	72	29	21	19	29	41	43	40	16	13
Broken bridge or trestle.....	38	44	16	17	21	21	20	26	33	19
Broken or defective switch.....	2	5	5	2	1	6	4	15	12	10
Broken or defective joint.....	3	4	1	2	2	2	1	10	5	3
Broken or defective frog.....	4	2	2	2	2	2	3	8	4	4
Bad track.....	1	1	1	1	1	1	1	1	1	1
Total defects of road.....	156	169	89	94	72	118	125	206	129	167
Broken wheel.....	31	58	21	21	5	12	22	33	20	26
Broken axle.....	52	50	30	30	18	43	38	39	20	21
Broken truck.....	14	10	7	11	13	8	10	15	8	7
Failure of coupling or draw-bar.....	1	1	1	2	4	1	1	3	7	8
Broken parallel or connecting rod.....	1	1	3	1	1	1	1	1	1	1
Broken car.....	1	1	1	1	1	1	1	1	1	1
Loose wheel.....	1	4	1	2	1	1	3	2	4	2
Fall of brake or brake-beam.....	1	1	1	1	1	1	1	1	1	1
Broken tire.....	1	1	1	1	1	1	1	1	1	1
Total defects of equipment.....	102	124	64	66	41	66	76	100	63	73
Misplaced switch.....	90	85	80	80	48	70	89	81	67	72
Rail removed for repairs.....	2	12	4	4	5	7	7	4	7	10
Making flying-switch.....	2	1	1	1	1	2	2	1	1	1
Runaway engine or train.....	2	1	5	1	2	1	3	1	1	6
Running through siding.....	1	3	5	3	6	3	6	2	3	3
Open draw.....	6	2	1	2	4	4	3	2	6	4
Careless stopping and starting.....	1	1	1	1	1	1	1	1	1	1
Overloading car.....	1	1	1	1	1	1	1	1	1	1
Bad switching.....	1	1	1	1	1	1	1	1	1	1
Total negligence in operating.....	101	104	98	90	65	85	108	100	93	101
Cattle on track.....	48	42	43	35	30	43	46	51	45	54
Snow or ice.....	5	15	8	22	13	25	16	36	13	9
Wash-out.....	23	18	17	11	30	17	40	44	10	30
Land-slide.....	7	14	4	7	4	11	9	11	1	1
Accidental obstruction.....	57	45	25	24	26	22	36	37	51	44
Malicious obstructions.....	15	13	8	3	15	11	11	21	22	11
Wind.....	2	3	3	3	1	2	2	7	1	1
Man on track.....	2	1	1	1	1	1	1	1	1	1
Flood over track.....	1	1	1	1	1	1	1	1	1	1
Total unforeseen obstructions.....	144	150	108	113	125	131	160	207	141	152
Others (1 each).....	238	310	237	192	175	177	185	222	218	315
Unexplained.....	742	857	597	557	481	581	655	840	655	815
ACCIDENTS WITHOUT COLLISION OR DERAILMENT:										
Bolter explosions.....	12	14	14	17	11	15	19	26	14	16
Cylinder explosions.....	1	1	3	1	1	3	3	6	3	3
Broken parallel or connecting rod.....	11	21	13	15	11	13	7	14	8	11
Broken axle.....	4	1	3	1	1	1	1	1	1	1
Cars burned while running.....	1	20	6	4	13	7	11	10	16	2
Broken wheel.....	1	1	1	1	1	1	1	1	1	1
Broken tire.....	1	1	1	1	1	1	1	1	1	1
Other breakages of rolling stock.....	3	1	2	2	4	4	4	8	16	19
Failure of bridge or trestle.....	2	1	1	1	1	1	1	1	1	1
Mass falling on running train.....	2	1	1	1	1	1	1	1	1	1
Accidental obstruction.....	1	1	1	1	1	1	1	1	1	1
Malicious obstruction.....	1	1	1	1	1	1	1	1	1	1
Unknown.....	1	1	1	1	1	1	1	1	1	1
Total without collision or derailment.....	42	65	44	43	39	42	48	83	66	76
RECAPITULATION.										
Collisions.....	581	536	437	310	220	268	279	278	260	392
Derailments.....	741	857	597	557	481	581	655	840	654	815
Other accidents.....	42	65	44	43	39	42	48	83	66	76
Total.....	1,364	1,458	1,078	910	740	891	982	1,201	980	1,283

ditions which make the train movement most complex. With complete statistics of the train movement in the several months, it would be possible, perhaps, to trace definitely the cause of the frequency of accidents in these months. Not infrequently one-tenth, and one year nearly one-eighth, of the accidents of the year have occurred in the month of August.

In years of much railroad construction, it is natural that there should be more accidents in the latter part of the year, as there are more railroads then. Last year the mileage worked was probably 11 per cent. greater in December than in January.

Last year was favorable for railroad working in the winter, as the weather was mild and there was very little obstruction by snow. There were later some tornadoes and floods which caused accidents, but perhaps not more than in the average year. The accidents, we see, were numerous in January, but they were not what we may call winter accidents, but chiefly accidents of management. After January the number was not great until August, but in the last five months of the year the number was greater than ever before—701 in 1882 against 650 in 1881, 636 in 1880, and 416 in 1879. Thus, though the accidents of 1882 are less than the year before, those of later months were exceptionally numerous, and about in the same proportion to mileage as the year before.

The increase in the number of victims of train accidents has not quite kept pace with the increase in the accidents, but they are still much too numerous. The number of accidents, of those killed and injured, and the number of those killed and injured per 100 accidents, has been, for ten years:

Year.	Accidents.	Killed.	Injured.	Per 100 accidents—Killed.	Per 100 accidents—Injured.
1873.....	1,283	276	1,172	21.5	90.1
1874.....	980	204	778	20.8	79.4
1875.....	1,201	234	1,107	19.5	92.2
1876.....	982	328	1,097	33.4	111.7
1877.....	891	214	1,047	24.0	117.5
1878.....	740	264	756	35.8	102.2
1879.....	610	185	709	30.3	78.0
1880.....	1,078	315	1,172	29.2	108.7
1881.....	1,458	414	1,597	28.4	109.0
1882.....	1,365	380	1,588	27.5	116.8

In the accompanying large table we present the accidents in the several years, classified according to their nature and causes:

Comparing 1882 with the previous year, we find that while there was a decrease in the derailments caused by defects of road and equipment, and no increase in those due to unforeseen obstructions or negligence in operating, there was a large increase in collisions—accidents which are peculiarly due to unskillful management or inefficient discipline. In defects of road there is a great decrease in broken rails, but it is more than balanced by the increase in loose and spread rails, which are due to negligence either in construction or maintenance. The failures of bridges are shamefully numerous, though fewer than the year before. The derailments by failure of equipment are nearly all included under accidents from broken wheels, broken axles and broken trucks. The broken axles are this year the most numerous and more numerous than ever before. It is perhaps remarkable that there should be so few serious accidents from these breakages, for the breakages are much more common than this record would indicate.

The effect of cold and snowy weather in increasing the accidents from broken rails has been illustrated both positively and negatively by these records. For the ten years the number of these accidents in the first quarter of the year and in the third quarter beginning with July has been:

Accidents from Broken Rails in the First and Third Quarter of the Calendar Year for Ten Years.

Year.	First Quarter.	Third Quarter.	Year.	First Quarter.	Third Quarter.
1873.....	65	5	1879.....	34	5
1874.....	20	5	1880.....	7	7
1875.....	90	3	1881.....	58	13
1876.....	26	5	1882.....	10	4
1877.....	26	7			
1878.....	7	2	Ten years.....	343	56

In the aggregate for the ten years the accidents from broken rails have been six times as many in January, February and March as in July, August and September. And every very cold winter can be de-

tected in the table by the number of broken-rail accidents, and the very mild winters by the small number of such accidents, as 1878 and 1880, which were almost spring-like, and 1882, when there was little severe cold and still less snow.

The accidents from broken wheels and axles at different seasons we have recorded only for the last two years; before 1881 they had not been numerous. The breakages of these in the first quarter of the last two years have been:

	1881.		1882.	
	Broken wheel.	Broken axle.	Broken wheel.	Broken axle.
First quarter.....	52	23	8	11
Year.....	78	51	34	50

Thus in the cold winter broken wheels caused 6½ times as many accidents as in the mild winter, and broken axles twice as many.

It is well, perhaps, to prevent drawing hasty conclusions as to the effect of cold on iron, to remind the reader that there is much rough and unelastic track in severe winters, causing unusual shocks to rails and rolling stock.

The number of each class of trains involved in collisions, derailments and other accidents was:

	Collisions.	Derailments.	Other accidents.	Total.
Passenger trains.....	34	232	24	290
Passenger and freight.....	147	...	...	147
Freight trains.....	400	510	18	928
Total.....	581	742	42	1,365

As two trains are involved in each collision, this shows that 505 passenger and 1,475 freight trains met with accidents last year, against 556 passenger and 1,498 freight trains in 1881, and 467 passenger and 1,068 freight trains in 1880. Compared with 1881 there was an increase of 24 per cent. in the freight train accidents, and a decrease of 9 per cent. in accidents to passenger trains.

The casualties due to accidents of different kinds for four years have been:

	Killed.	Collisions.	Derailments.	Other accidents.	Total.
1879.....	94	97	24	185	380
1880.....	150	143	16	315	404
1881.....	209	190	15	414	504
1882.....	177	200	3	380	480
Injured:					
1879.....	286	389	34	709	1,365
1880.....	412	714	46	1,172	2,244
1881.....	565	995	37	1,597	3,197
1882.....	588	975	35	1,588	3,198

Of the entire number of accidents reported, 1,365, only 225 caused the death of any person, but 311 others caused injury. About 40 per cent. of the whole number, therefore, caused personal injury.

For the first time we are able to give the number of passengers and employes killed and injured, as follows:

	Passengers.	Employes.	Total.
Killed.....	104	276	380
Injured.....	783	805	1,588

There were probably about 535,000 railroad employes in the country at the close of 1882, not 1 per cent. of the population of the country, yet from this small class it seems came nearly three-fourths of the persons killed and more than one-half of those injured by train accidents, while, as we have shown before, so many more of them are killed and hurt on the railroads by other than train accidents that the latter are among the least of the dangers to which they are exposed. In New York alone in the year to Sept. 30, 1880, 127 railroad employes were killed and 514 injured by accidents; how many by train accidents we have no means of knowing, but on the Erie that year only 2 out of 48 employes killed and 4 out of 239 injured suffered from train accidents. In view of the immensely greater injury to life and limb to employes than to passengers, and from other causes than train accidents, the latter seem almost insignificant in their effects. And there is no doubt that the startling character of train accidents, the wholesale slaughter which they sometimes cause, and the prominence of some of their victims have caused an unusual amount of public attention to be turned to them. The railroads suffer infinitely more in public opinion, which has a great effect in impelling them to make expenditures and exertions to secure safety, from the killing of tens of passengers by train accidents, than by the slaughter of hundreds of employes, one by one, working on and around trains, or by the almost as numerous deaths of other persons who are killed one by one on their tracks and crossings. Doubtless it is easier to assure the safety of passengers than that of employes, but the enormously greater loss of life and limb of the latter class makes it desirable that something of the same effort should be made for this small class, whose dangers are so great, as has been given to the large class of passengers, whose voices are loud and whose injuries are costly to the railroads, but whose sufferings and dangers are comparatively insignificant.

January Earnings.

January earnings have been reported so far by 55 railroads, having 45,748 miles of road this year and 9 per cent. more than last year. Their earnings were 7½ per cent. more this year than last, but the average earnings per mile decreased from \$423 to \$414. Most of the Northwestern roads report decreases, though most of them have a large increase in mileage.

The figures from several of them are:

	Total earnings.		Per mile.	
	1883.	1882.	1883.	1882.
Bur., Cedar Rapids & N.....	\$197,402	\$252,823	\$287	\$408
Central Iowa.....	77,309	93,931	317	381
Chic., Mil. & St. Paul.....	1,359,000	1,434,536	304	350
Chic. & Northwest.....	1,382,700	1,644,930	386	527
Chic., St. P., Minn. & Oma.....	302,700	327,400	259	326
Green Bay, Winona & St. P.....	23,828	25,501	106	117
Union Pacific.....	1,732,000	1,963,000	415	590
Total.....	\$5,074,935	\$5,741,221	\$370	\$442
Total miles.....	13,726	12,976		
Increase.....				
Northern Pacific.....	\$392,036	\$245,369	\$255	\$252
St. Paul, Minn. & Man.....	486,763	395,461	392	434
Milwaukee, Lake Shore & West.....	65,381	65,293	214	237
Total.....	\$947,180	\$706,123	\$306	\$327
Miles.....	3,091	2,159		

The Union Pacific perhaps ought not to be included with the Northwestern roads, as its traffic has not been affected by the same cause, namely, the snow blockades, but more by the causes which also reduced the traffic of the Denver & Rio Grande. The Northern Pacific and the Manitoba, the northernmost of these roads, have not suffered much from snow. They no longer show the great increases of previous months, and their earnings per mile are very light; but this is common with them in winter, when their traffic falls off more than that of roads further south. Both of these roads but a little while ago were earning twice as much per month as in January. The group which have decreases fell off 11.6 per cent. in total earnings and 16.3 per cent. in earnings per mile.

The other notable decreases were:

	Total earnings.		Per mile.	
	1883.	1882.	1883.	1882.
Cin., Ind., St. L. & Chic.....	\$191,826	\$218,590	\$328	\$602
Denver & Rio Grande.....	418,300	488,590	361	400
Ohio Central.....	75,582	90,854	356	429
Peoria, Dec. & Ev.....	50,483	67,755	199	267
Total.....	\$736,191	\$865,807	\$370	\$458
Miles.....	1,989	1,891		

The two groups of roads with decreases had 15,715 miles of road this year and 14,867 last year, and their aggregate earnings decreased from \$6,607,028 to \$5,811,126. Now if we remove these eleven roads from the list, we find that then the other 44 roads together show the following results:

	1883.	1882.	Increase.	P. c.
Miles.....	30,033	26,728	3,305	12.4
Gross earnings.....	\$13,149,601	\$11,005,085	\$2,144,524	19.5
Earnings per mile.....	438	412	26	6.3

Thus if we remove the Northwestern roads that suffered from snow, together with the Union Pacific and the Denver & Rio Grande, we find the reporting railroads show an improvement over last year.

So far as the Northwestern railroads are concerned, it should be said that not only did they suffer from the weather this year, but their traffic last year was extraordinary, high prices and an impending advance of trunk line rates having drawn out a January grain business much larger than ever before known, in spite of the short crops. This is apt to be overlooked, because the year as a whole was unfavorable to these roads. They were doing well last January when most other roads were doing poorly, and a large decrease on them is not now so significant as one on the lines which were doing badly last year.

Just as soon as we leave the Northwestern group of roads, the southernmost of which is the Chicago & Northwestern, we find a better showing. The Chicago & Alton makes a good gain (9 per cent.), the Hannibal & St. Joseph a very large one (43 per cent.), the Wabash a moderate one (about 6 per cent.), the Alton & Terre Haute main line gains 15 per cent.

Going further, to the roads west and south of St. Louis, we find great gains—33 per cent. by the Missouri Pacific, 71 by the Central Branch, 8 by the St. Louis & San Francisco, 36 by the Missouri, Kansas & Texas, 29 by the Iron Mountain, 45 by the International & Great Northern, 65 by the Texas & Pacific, 59 by the Gulf, Colorado & Santa Fe, 47 by the Little Rock & Fort Smith. But as to these we must bear in mind that their traffic was wretched last year in January, and we must not be too much encouraged by their great gains, as we should not be too much discouraged by the losses of the Northwestern roads, which had an exceptionally large business last year.

The Southern roads east of the Mississippi generally show satisfactory gains, if not so large as those of the Southwestern roads—the Mobile & Ohio 36 per cent., the Louisville & Nashville 15½, the East Tennessee 20, the Norfolk & Western 15, the Chesapeake & Ohio 17.

From Eastern roads there are very few reports. The Grand Trunk has gained 15 per cent., the Eastern

9, the New York & New England 21, the Long Island 6. Trunk-line earnings were bad in January last year, but other earnings on Eastern roads were good.

Generally, so far as returns have come in, they indicate poor earnings on the Northwestern railroads in the snow belt—say north of Missouri—and in Far West beyond the agricultural districts, where mining and grazing afford the chief traffic; tolerable earnings further in the east in Indiana, Ohio and Michigan (with no data from through lines, which must have carried less but received more than last year); good earnings in the East (but very meagre data to judge by); better ones in the South east of the Mississippi, and magnificent ones in the Southwest, as far north as Iowa, apparently, and certainly as far as the Missouri River. The falling off in the Northwest has little significance; but earnings reported east of the Mississippi and north of the Ohio indicate some dullness in business, which may be due to less activity in manufacturing enterprises, which have been multiplying greatly in this country for some years past. The number of lines reporting, however, is not sufficient to warrant a final judgment on the average condition of railroad business even, except in the South, the Southwest and the Northwest as far south as the Chicago-Omaha line of the Northwestern. To judge of traffic in Ohio, Michigan and Indiana without returns from the Michigan Central, the Lake Shore, the Fort Wayne, the Pan-Handle, the New York, Pennsylvania & Ohio and the other lines which with nearly all the through traffic have the larger part of the local traffic, is impossible. And there is nothing in the returns so far to give any indication of business in New York and Pennsylvania, the chief manufacturing states, which together have more than a sixth of the total population of the country.

The Cost of Carrying Dead Weight.

A letter from a correspondent on this subject will be found on another page. As he has fallen into some very common errors, it will perhaps be worth while to indicate wherein some of his arguments and inferences seem to be erroneous.

He has fallen into a mistake, which is very often made by those who first begin to consider the cost of transportation. The error is this: he says it costs 0.8 of a cent per ton per mile to carry freight, and then assumes that it costs just as much to carry dead or non-paying weight as it does to carry paying freight. There is a mental tangle here, which perhaps can be unsnarled by an example easier than in any other way.

Let us suppose then the case of a freight train which runs backward and forward over a road 100 miles long and consists of 25 cars which weigh 10 tons each, with a maximum capacity for carrying say 15 tons of freight. Now, in ordinary traffic, as every body knows, cars are not uniformly loaded to their maximum capacity. Some are only partly loaded and others are empty, so that usually the average dead weight of cars hauled is much more than that of paying freight. This proposition of course varies according to the nature of the traffic. For our illustration, though, it will be assumed that the average proportion of dead to paying weight is as 1½ to 1. The average load of each car on our train is therefore 8 tons, and the average load for the whole train will be 25 × 8 = 200 tons. If the average cost on our hypothetical road is 0.8 cent per ton per mile for carrying freight, the cost per mile for the whole train will be 200 × 0.8 = \$1.60. The weight of the engine and tender, for such a train, would be about 50 tons, so that the whole weight of train would be 250 tons of cars + 200 tons of freight + 50 tons of engine and tender = 500 tons. Now it costs \$1.60 per mile for hauling these 500 tons of freight cars and engines, which would be only 0.32 cent per ton for the whole. Ordinarily in calculating the cost of carrying freight the dead weight of train is entirely omitted, and the average cost for carrying freight is obtained by dividing the total cost by the number of tons of freight alone.

The average cost of carrying freight, obtained in this way, which is assumed by our correspondent, is also high. On our trunk lines the average cost is now less than ½ cent per ton per mile.

But there are other reasons which show that the cost of hauling dead weight is still less even than the above calculations indicate. There are many expenses of operating a railroad which are not affected at all by the amount of dead-weight hauled. Such for example as general officers' and clerks' salaries, agencies and advertising, repairs of buildings and fixtures. None of the other expenses are affected in proportion to the dead weight hauled, excepting, perhaps, rail renewals. To show how this is we give herewith a list of the expenses of the Lake Shore road for 1881

and the per cent. of each to the total cost of operating. The percentages are separated into two columns, the one including those expenses which are affected to a limited extent only by the dead weight carried, and the other those which are not at all affected thereby:

EXPENSES.	Expenses affected to a limited extent by dead weight.....	Expenses not affected by dead weight.....
	Per cent.	Per cent.
Salaries, general officers and clerks.....		2.65
Law expenses.....		.41
Stationery and printing.....		.61
Outside agencies and advertising.....		2.22
Contingencies.....		.31
Repairs of bridges (including culverts and cattle-guards).....	1.24	
Repairs of buildings and fixtures.....		2.78
Repairs of fences, road-crossings and signs.....		.56
Rail renewals.....	3.67	
Tie renewals.....	2.56	
Repairs roadway and track.....	8.54	
Repairs locomotives.....	6.20	
Fuel for locomotives.....	10.87	
Water supply.....		.60
Oil and waste.....	1.09	
Locomotive service.....	8.70	
Repairs passenger cars.....		1.95
Passenger train service.....		1.99
Passenger train supplies.....		.21
Repairs freight cars.....		6.01
Freight train service.....	5.15	
Freight train supplies.....	.14	
Telegraph expenses (maintaining and operating).....		2.16
Damage and loss of freight and baggage.....		.44
Damage to property, including cattle.....		.34
Personal injuries.....		18.62
Agents and station service.....		.71
Station supplies.....		.95
Rents payable.....		4.34
Hire of cars (debit balance).....		4.19
Taxes.....		
	52.50	47.50

From this table it will be seen that 47½ per cent. of the total operating expenses are not affected at all by the amount of dead weight carried. Some of the other expenses are increased, if at all, to an almost inappreciable extent. Repairs of bridges would probably not be diminished to any noticeable extent by lessening the dead weight. The same is true of tie renewals, as dead weight has very little influence on decay. The only way in which locomotive service, freight train service, freight train supplies and hire of cars will be increased is because the addition of dead weight might make more trains necessary. If the size and the capacity of the locomotives were increased, no more trains would be needed with much dead weight than are required with little. It might be supposed that if there is any one expense which would be in proportion to the dead weight it would be that of fuel. But if it is kept in mind that it takes about a third or a fourth of the fuel consumed to haul the engine and tender alone, without any train, it will be seen that this item of expense is not in proportion to the extra weight carried.

In fact, the cost of repairs of passenger and freight cars would probably be increased by reducing the dead weight. As these two items of expense amount to 7.96 per cent. of the total, the fact of their increase by a reduction of dead weight is worth consideration.

It will be seen then that the reduction of operating expenses which can be effected by diminishing dead weight is extremely small, but the doctrine of salvation to railroads through casting off of dead weight was so assiduously preached some years ago by the advocates of narrow-gauge roads that by mere iteration it has ground into men's minds so that it is hard to displace it. Of course there is some loss due to carrying dead weight; but, unless it makes an increase in the number of trains necessary this loss is extremely small, and hardly worth considering if there are any advantages to be gained by making cars heavier.

The Political Economy of Railroads.

III.

LESSONS TAUGHT BY RAILROAD HISTORY.

In Germany and Austria the same policy as in England was pursued for a time, and with the same damaging effects. At present competition has ceased in both countries, on account of voluntary agreement of the different companies to charge the same rates and divide the business. In Germany at present most of the railroads are owned and managed by the state.

France.—In France the theory of competition was allowed only for a short time to exercise its baneful influence. After abandoning this theory, France adopted the one diametrically opposed to it, and has stuck to it ever since. Only railroad monopolies were allowed, and these were regulated by the state.

Competition of Different Carriers on One and the Same Railroad.—When the idea of competition by means of parallel lines and a multiplication of railroad centres was proved, at first practically, then theoretically, to be imprac-

ticable, the "Manchester school" of economists was still unable to give up its belief in the doctrine of free competition. The word "monopoly" appeared so horrible! It was inconceivable that there was any place in economic life where *laissez faire* was not the only true and saving policy! The adherents of this school accordingly eagerly took up with the proposition that the solution of the railroad problem consisted, not in competing lines, but in competition upon one and the same line. Competition was given up as regards the way, but was maintained as regards the motive power and cars. The roadway was to be used so as to correspond to ordinary streets, and different parties were to employ their own locomotives and cars. This theory resulted from a failure to see the essential difference between railroads and other highways. In the English "Railway Clauses Consolidation Act" of 1845 provision is made for the use of the railroads by any one possessing properly constructed engines and cars. Maximum rates for the use of the railroads are also established. The Prussian railroad act of November, 1838, contains a similar provision. It was thought at the time that means would be invented which would enable trains to turn out and pass wherever they pleased. It has never in any country been found possible to realize this idea. The three elements of railroad transportation, the way, the motive power and the cars, are in their technical nature so closely related that it is impossible to separate them in management. Even the use of a station by two or three railroad administrations is the cause of numerous difficulties. Specialists and experts have never been able to see how it is possible to use a railroad like an ordinary street, allowing any one to run his own train.

Let us suppose that an early morning train now satisfies a given demand for transportation. How would it be possible to treat four competitors with four trains in the same manner? After train number one has left the depot a certain time must intervene before number two can be dispatched, and number four may be obliged to start so late as to be *de facto* no competitor at all of number one. Again, if one locomotive and ten cars are now sufficient in the supposed case, four locomotives and some twenty cars would be required. The working expenses would be increased with the increase of competition. Larger stations would be required; single-track roads would need to be changed into double-track roads; double-track roads would require four tracks. Now, how it is possible to increase so largely the cost of transportation, and at the same time reduce rates, is not clear.

A modification of the plan just described is to force every railroad company in a country to allow every other company to use its tracks. The objections to this arrangement are similar to those urged against the proposal to allow any one to run his own train wherever he pleased. Cases frequently occur where two or more companies by voluntary agreement use the same track for a longer or shorter distance, but the difficulties increase very rapidly with the increase in the number of companies using the same track. It is, too, altogether different whether a company voluntarily agrees to allow another to use its track or is forced to do so.

A committee of the House of Commons, in 1853, investigated the plan we are discussing. Robert Stephenson testified that considerations of safety and good management led him to condemn most strongly forced running powers. All others, with one exception, who testified were of the same opinion. An investigation in 1872 led to the same results. It was decided to be absolutely impracticable to force the owners of a railroad to grant others running powers.

It has been still further proposed that the railroad companies should transport or convey over their track cars furnished and filled by others. Different persons and companies would then hire or purchase cars and offer the use of them to the public. Between them a competition would arise which would introduce this much-searched-for competition into railroad business.

The obstacles in the way of the realization of this plan ought to be obvious. If the railroads still continue to keep cars of their own, they will certainly favor their own trains. If others compete with them in carrying freight on their lines it would be impossible to demand of them, as now required by law, that they should be prepared to carry all goods delivered them for transportation. Again, who would regulate the price the companies should or might charge for the motive power to convey a loaded car *x* miles? It is also obvious that the number of competitors could not be so very great. To obtain any influential position as a carrier of freight would require the possession of a large number of cars, important warehouses for storing goods, repair shops, etc., all requiring no inconsiderable capital. Another consideration of importance is that of safety. It would be impossible for the railroad companies to inspect every car which they might be required to take over their tracks and to assume the responsibility for safe carriage. The express and dispatch companies in the United States have been referred to in order to show the possibility of separating freight and passenger business from the supply of the motive power, but whoever is practically acquainted with the workings of these companies will fail to find in them any ground for the expectation that such an arrangement will furnish the useful competition.

Water-ways as Competitors.—An attempt has been made to sustain the view of railroads as private undertakings by referring to the competition of rivers, canals, etc. This position, which is so absurd as hardly to deserve notice, was first taken in England, where the railroads were built for the express purpose of taking away from the water-ways an already highly developed freight business, and where the inferiority of the latter was soon developed. In some respects, indeed, the great natural water-ways are equal and even superior to railroads; but, with few exceptions, this is

not the case with canals. To the expense of keeping up the canal must be added interest on the cost of building it. Now the amount of business which can be done by a canal in ordinary circumstances is not so large that the actual cost of the use of the canal does not form a considerable part of the cost of transportation. If the state builds the canals and derives no profit from the money invested, the cost of transportation is lessened; but in a similar manner the state might lessen the cost of railroad freight. In any case, the taxpayers have to bear the burden of the taxes by which the states raise the money so used.

In a concrete case of competition between a railroad and a water-way, the railroad competes if necessary by means of discriminating rates. Where or when the competition ceases, rates are necessarily higher. As regards the use of waterways, England is exceptionally favored on account of its geographical situation, but there the vessels have not been able to compete successfully with the railroads. The amount of business done by vessels engaged in the coast trade since 1866 has decreased, while that done by the railroads has steadily increased. The same has been the case in France. The victory gained by the railroads in England over the canals was more complete and accomplished sooner. The competition on the part of the canals was a miserable, hopeless one, leading sooner or later to ruin. Where this is not the case the competition is liable to cease at any moment, on account of an understanding between the canal and the railroad according to which they agree to cease competing. The powerful weapon of the railroads in this battle was discriminating rates. The "survival of the fittest" holds in this case as elsewhere.

STATE AND PRIVATE RAILROADS.

Having already shown the public nature of railroads, Dr. Sax considers more at length the management of railroads by delegated authority and their management directly by the government. In the first place, it is to be remarked that the terminology in common use is not entirely correct, as private railroads in the narrow sense of the term exist in no country. Any one who bears in mind and appreciates the position of railroads as monopolies, as well as their public character, must necessarily incline very strongly to state railroads, so long as he regards railroad companies as purely private associations for carrying on a purely private business. When the building and working of railroads by railroad companies is regarded and treated as a delegated public undertaking, one is far less hasty in pronouncing for state railroads. A further error to be avoided is to imagine that any decision can be reached which will answer absolutely for all times and places. Dr. Sax then marshals as follows some of the arguments brought forward by both sides:

Extension of the Railroad System and Location of the Line.—The reasons for preferring state railroads in this respect as stated by their adherents are as follows: Railroad companies, they say, choose at first the most profitable and easily built routes. This in itself is proper because such routes are often economically the most important for the country. But the consequence is that later on private parties are unwilling to build the less profitable lines and there are great gaps in the railroad system, which also lacks system and unity; or these lines necessary to fill up the gaps are built with government assistance, as guarantee of interest on bonds, etc. This involves expenses for the taxpayers. But if the state itself builds the entire railroad system, it can draw up a uniform and systematic network, supplying the whole land more evenly with railroads and building and working the poor lines with the surplus derived from the more profitable ones.

Now, this would tell very strongly in favor of state railroads, were there no way to accomplish the same by means of private railroads—using the term "private railroads" in the broader sense already explained, for the sake of convenience. We have only to examine the French system of concessions to see how it is possible to do it. In France, in the very beginning, a plan was drawn up for supplying the entire country with railroads and confirmed by law, and this plan later on was extended systematically in the same manner. The order and time of building the different roads was determined by law, and concessions were granted accordingly. When it came to building the less profitable lines guarantees of interest were given only on condition that a part of the surplus of the profitable "old system" should be toward paying the expenses and interest charges of the unprofitable "new system." That the same desirable manner of building railroads did not obtain elsewhere was not owing to any weakness inherent in private railroads, but to faulty and imperfect legislation.

It is said further that private companies are more dependent upon the condition of the money market than the government; that private railroads are built chiefly in times of speculation; that their development is irregular—now too rapid, now too slow. The state alone, it is argued, can extend its railroad system uniformly. Again, the great number of companies causes increased expense in management and a want of harmony in plans.

There is some truth in these charges, but faulty legislation is again to blame. Precipitation in railroad building is impossible if too numerous concessions are not granted. It is the function of the state to prevent injury to the citizens as a whole by wisely guiding private activity in railroad matters. If the state has not the wisdom to do this, it certainly ought not to build and work railroads itself. Besides, great railroad companies have always extended their lines with some sort of uniformity, and planned building for years in advance. Their credit is good; in some cases, even better than that of the state within whose boundaries they lie. Only small, weak undertakings have a credit decidedly inferior to that of government, and that is not a reason for abolishing private rail-

roads, but for not dividing up the concessions among a great number of small companies.

"Railroad frauds and railroad fallacies" in raising money for private roads in stock exchange speculation are urged against private railroads, but our legislators have now had experience enough so that they ought to be able to suppress a good part of the swindles. If trunk and branch lines are built by the same companies, as in France, the dividends are tolerably stable, the shares will not vary greatly in price, and the field open to speculation will be narrowed down. French railroad securities have not varied more in price than French government bonds.

It is said on the other hand that private enterprise builds more economically than the state, and that in consequence private railroads should be preferred. It seems hardly credible that any one in Germany could assume this position, but there are those so blinded to facts by their "let alone" policy and their opposition to state activity as not to see that it is not at all necessary that the state should build its railroads, even were it true that private parties would do it for less. The state can give the job of building a desired railroad to the lowest bidder, and here we have private competition again. There is no reason to doubt that in drawing up the plan, and in control, the state engineers would work with the same ambition and the same conscientiousness as private engineers.

It is urged against private railroads that it is often the interest of the directors of a railroad company not to build the road with the money at first subscribed. They find it often profitable to issue new shares, to borrow money on bonds and to be as long in building as possible. Dr. Sax (who was for some time himself an officer of a railroad company) does not share this bad opinion of the private companies. It is barely possible that cases have happened where roads have purposely been built extravagantly for the sake of issuing bonds. In some cases unnecessary branch lines may have been built for this purpose, but this has been possible only in countries with insufficient state control, particularly in the United States. But where such swindles occur in building private railroads, there is no certainty that they will not occur in the case of government roads. Honesty in undertakings of this character depends upon the average morality, the conscientiousness of the people as a whole. We must not forget countries in which private companies give a better guarantee against the omnipotence of "backbitch" than the government. When one bears in mind the corruption in the civil service of the United States, will he be inclined to think that railroads, there would have been built and worked by the government with fewer frauds and deceptions than by private companies?

The state official is less free in his actions than the one in employ of a company. He is more restrained by formulas, rules and regulations. Where the state railroad system rules supreme, there is a certain awkwardness and tardiness in the application of inventions, in making use of concrete advantages and departures from general principles. These evils of state railroads were of particular weight in the early history of railroads, when changes were so constant, particularly in countries with an old and strong bureaucracy, like the German states, France and Austria. In the present advanced conditions of railroad knowledge, they are of less importance. It must be admitted that in the development period of railroads, it is preferable that they should be worked by private companies wherever the civil service has not attained such a degree of excellence as to combat successfully with the weakness inherent in state administration, and English red-tape is, for example, absolutely incompatible with a good state administration of railroads. Even in Germany, where from the beginning state and private railroads existed side by side, it was some time before the peculiar evils of bureaucratic administration were conquered, or nearly so. The fanatical adherents of state railroads appeal to the excellent administration in European states of the post and telegraph, but forget that the administration of post and telegraph is technically and economically as simple as that of railroads is difficult.

It is argued in favor of the state railroads that they do not, like private railroads, in "hard times," cut down expenses to the disadvantage of the public as regards safety, speed and reliability. This is often repeated, but no statistical proof has been given. The years 1872-76 were trying times for business men, so that a comparison between the service of Prussian state railroads and Prussian private railroads during these years ought to be a fair test, particularly as the Prussian state administration is regarded as a model. Dr. Sax gives the official Prussian statistics for these five years, as follows:

No. of express trains on—			
a.	b.	c.	
State railroads.	Private roads worked by state.	Private roads worked by companies.	
1872.....	22,714	7,793	47,665
1873.....	22,728	10,847	58,977
1874.....	29,555	13,093	55,079
1875.....	30,524	12,413	53,792
1876.....	32,532	9,199	51,982
Number of accommodation trains.			
1872.....	117,844	113,732	216,043
1873.....	124,094	143,565	254,364
1874.....	146,322	146,096	274,903
1875.....	152,839	153,637	287,084
1876.....	147,233	119,735	295,118
Number of mixed trains, passenger and freight.			
1872.....	42,241	33,113	114,065
1873.....	44,115	45,397	114,005
1874.....	62,149	57,880	115,080
1875.....	61,460	63,525	109,716
1876.....	76,322	66,260	129,076

We must compare the number of passengers, with the number of trains in order to discover whether state or private roads did the most to accommodate the public. We

give in the following table the number of millions of passengers carried.

	a.	b.	c.
1872.....	24,831	16,863	44,748
1873.....	23,092	20,360	51,176
1874.....	32,272	21,713	55,583
1875.....	32,201	22,529	60,991
1876.....	32,381	22,340	61,730

The number of passengers carried by the group a (state railroads) remains nearly stationary during the years 1874-76, while the number of express trains run to accommodate these increased considerably; the number of accommodation trains was increased in 1875, but reduced in 1876. It is difficult to draw any conclusions from the number of mixed trains run, as their increase was due largely to the opening of new short branch lines. The group b (private railroads under state management—permanent lease, etc.—therefore to be classed with state roads) carried an increased number of passengers during these years (1874-76) in fewer express and accommodation trains.

Private railroads, c, carry an increasing number of passengers in fewer express trains but in a largely increased number of accommodation trains. The comparison cannot be said to be to the disadvantage of private railroads.

If we continue the comparison we shall not find that state railroads in Prussia—the only place where we have a fair chance to compare the two systems—did more for the public in the way of speed than the private roads.

The following table gives the average speed per hour (exclusive of stops) in kilometers (a kilometer equals 0.62135 mile):

Express trains.			
Year.	a.	b.	c.
1872.....	51.2	50.3	51.7
1873.....	52.2	52.5	52.8
1874.....	52.4	52.1	53.1
1875.....	52.6	51.6	52.7
1876.....	52.0	48.8	52.8
Accommodation trains.			
1872.....	38.8	37.7	40.8
1873.....	39.5	39.0	41.3
1874.....	40.4	38.7	40.9
1875.....	40.0	38.4	40.9
1876.....	40.2	39.2	40.1

In 1876 the average speed of all trains was, per hour, in kilometers, 30.0 for group a, 28.4 for group b, 31.2 for group c, the private railroads.

The percentage of all trains behind time in the different groups was:

Year.	a.	b.	c.
1872.....	2.7 p. c.	3.1 p. c.	4.1 p. c.
1873.....	2.4 "	3.1 "	5.0 "
1874.....	1.3 "	3.1 "	2.5 "
1875.....	0.9 "	2.5 "	2.2 "
1876.....	0.9 "	2.9 "	1.5 "

In this respect it would seem that the state administration made greater exertions to obtain regularity, but this is only apparent. It is much easier to avoid numerous "behind times" with double tracks than single. Now of the entire length of railroads worked the length provided with double tracks was:

Year.	a.	b.	c.
1872.....	49	36	32 per cent.
1876.....	58	33	29 "

According to the Imperial Statistical Bureau the number of persons killed or injured on German railroads, including employes, was, in 1877, 1,861. Of these 1,112 were killed on state railroads, 549 on private railroads. The length of the state railroads was 19,655 kilometers and the number of "axle kilometers" run (1 axle kilometer = $\frac{1}{2}$ or $\frac{1}{4}$ car kilometer) was 4,330,980 millions; the length of private roads, 14,545, and the kilometers run 2,729,251 millions. One accident happened:

On state railroads to 17.68 kilometers and 3,894 million axle kilometers.

On private railroads to 26.49 kilometers and 4,911 million axle kilometers.

This comparison is not favorable to state railroads.

If in some countries, particularly in Anglo-Saxon countries, private railroads carry their economy so far as seriously to inconvenience the public or to endanger life, it is simply the fault of imperfect legislation.

As regards working expenses, the Prussian state and private railroads are both managed so similarly and with such similar results, that statistics furnish no decisive ground for favoring the one kind of railroads or the other. The management of both appears to be excellent.

The Political, Social-political and Ethical Side of the Question.—In opposition to the fears excited in the one party by reflecting on the immense power which the direct management of the railroads would confer upon the government, the other emphasizes the inconveniences and dangers, both political and social, of mighty private corporations, and represents these as the more terrible in proportion as it closes the eyes to the danger of the other alternative. Strong words and exaggerations play an important rôle on both sides.

The political dangers of private railroads were not discovered recently. They were eloquently described by de Lamartine in the French Chambers in 1838. The prophecies of the poet have not been fulfilled, however, in France, and perhaps because in fear of their fulfillment the government took a strong position in railroad matters. The insufficient and imperfect railroad legislation and state control of England likewise prove nothing against properly regulated private railroads, especially where a strong government exists, as in Austria and Germany. On the other hand, Dr. Sax cannot share the exaggerated fears which one entertains of dependency upon the government. The control of publicity and a good constitution are the means of warding off the danger. The opportunities of corruption are pretty much the same whether the railroads are managed by government or private companies. All depends upon the general moral atmosphere. If that is pure, private and state

railroads will on the whole be pure. "There are black sheep in every flock, and nothing under the sun is perfect."

It is more important to remember that the government acts as an organ of control over private railroads, and it is a trait of human character that one is more severe against others than against one's self. In the case of state railroads the organ of control is the Parliament. An efficient parliamentary control is possible in small states like Belgium, but is impossible in great states like Prussia, as every one can testify who has listened to the discussion in the Prussian Parliament of the account for railroads in the budget.

The result of Dr. Sax's investigation of the controversy over state and private railroads is, to a great extent, negative. In fact, he finds it impossible, *a priori*, to decide absolutely for the direct administration of railroads by the state or for their administration by authority delegated to companies, i. e., so-called private railroad companies. It lies in the nature of things, as he has shown, that private railroads, strictly speaking, prevail in no country and are inadmissible. It all depends upon "nation and people." That administrative form is to be chosen which, under the given circumstances, is the best.

The most perfect railroad law is that of France, and the railroad system of no country furnishes more that is profitable for study. Recognizing that eventually railroads must be monopolies, it was not attempted to make anything else of them. Railroad concessions and monopolies were granted to parties under numerous conditions and reservations of rights. The government gave much, but received much. Railroads were distinctly recognized as public highways, and an active state control allowed. In return for what was granted them, railroads in the "cahiers des charges" have agreed to perform numerous and very considerable services for the state.

Telegraph Consolidation.

For a year or two past the Western Union Telegraph Company has had a rival, the Mutual Union Telegraph Company, one of a long series of rivals, of which it is difficult to see why there should be any end. It is now reported that the Western Union has leased the Mutual Union's lines and is again without any important competitor. We do not know that we can make any better comment on this event than to copy an article which has served us twice already on similar occasions, and which we expect to have cause to use again at intervals.

The article first appeared in our issue of Aug. 24, 1877, at the time of the combination of the Western Union and the Atlantic & Pacific. Jan. 14, 1881, it was republished, as a commentary on the consolidation of the Western Union and the American Union, with the following note:

"A telegraph consolidation is announced which gives us occasion to republish some comments we made at the time of the union of the Western Union and the Atlantic & Pacific, nearly three years and a half ago. In addition to the inducements there mentioned to start a rival telegraph company and afterward unite with the old one, is the opportunity which it affords for making a gigantic speculation. The new company spoils business, and this brings down the old company's stock, and the promoters of the new company make one fortune out of that; then they load themselves up with the low-priced stock, agree on a combination or consolidation, and make another fortune on the rise. The parties who started the American Union Company are largely the same as those who managed the Atlantic & Pacific affairs some years ago, and it is not easy to see why these tactics cannot be repeated an indefinite number of times."

In the case of the Mutual Union it was not the promoters of the American Union and the Atlantic & Pacific who managed the new competitor, but it was imitators of them, who began before the American Union was fairly out of the way, we believe. And neither the circumstances of the times nor the resources of the promoters enabled them to make of it so great a success as the American Union proved to be. Probably the operations in connection with the union of the two companies will bring no one a great fortune at this time, which is not favorable to great speculative movements, but they may have saved both parties from great losses.

The article first published Aug. 24, 1877 is as follows:

"The telegraph war has at last ended, as doubtless was intended by those who begun it, by the virtual consolidation of the Western Union with the Atlantic & Pacific. The result is almost inevitable when competition is attempted between two telegraph companies which cover the same field, and unfortunately circumstances make such competition unusually easy in the case of telegraph business. When a new company attempts to compete with the Western Union on ground occupied by the latter, if the old company has followed ordinary business instincts it has supplied the facilities required for all the business which will pay at the places where it has offices. Whatever capital may be invested by the new company in an attempt to serve the same places, therefore, is so much added to the necessary investment, and if both companies do a profitable business, then their customers pay more for interest on their investments than would be necessary if there were but one telegraph company. More than that, the expenses of the old company are very little reduced, even when a considerable portion of its business has been diverted to the competing line, and the expenses of the two companies are much greater than those of one doing the work of both would be. If, then, rates should be made to just cover profits and 6 per cent. (or any other) rate of interest on the capital invested, the very first effect of a competing telegraph would be to raise the rates. However, it is well known, the reverse is the fact. At points where they compete the two

companies do business at cost, or much below cost. The new company cannot hope to make any profit unless either it does more business than the old one per dollar invested, or does its work at lower cost. It is commonly charged that the capital of the Western Union is largely in excess of the value of its property, and probably enough this is true—at least, the effect of such competition as that of the Atlantic & Pacific is inevitably to make it too large. On the score of expenses, it is not probable that a new and small company will do any better than an old and large one, and in all cases the chief part of the earnings goes for expenses.

"But if a new company has little power to make profits for itself, it has great power to destroy the profits of its competitors. Most telegraph business comes from the large cities, and a comparatively small investment will pay for lines between the leading towns. Thus so long as it can pay expenses a new company without a very large capital can very greatly injure a rival, however old and well established. So, though the old company may have no use for its rival's lines and other property, it will very much desire to get it out of the way, and unless it can actually kill it by competition—by making all its business worth less than its cost—it will finally be greatly tempted to pay something merely to get it out of the way; indeed, if it bankrupts it by competition it has to do substantially the same thing; it must buy the bankrupt lines else they will again spoil business in a new owner's hands; the difference is that if the competition ends before bankruptcy the proprietors of the new line get better pay for their investment—sometimes, indeed, very high pay.

"It is now doubtless inevitable either that the interest on telegraph investments be less or that the rates paid for telegraphing be higher than would have been the case if the Atlantic & Pacific had never entered the field against the Western Union. Virtually the effect of its competition has been to increase considerably the necessary investment in telegraph property in this country. And, what is most regrettable, the next great scheme of competition will start with chances fairer than ever. If the Atlantic & Pacific could hope to succeed because it could provide lines at much less average cost than that of the Western Union lines, the Coming Telegraph Company's hopes will be stronger now that the Atlantic & Pacific investment is added to the Western Union's. And doubtless its projectors will reason that if they cannot make money from their business they will at least be likely to sell out at a profit to the Western Union. If they have nerve and capital they can spoil its business if it does not come to terms; and if it does come to terms then we have the investment of the Coming Telegraph Company added to that of those which have preceded it—a totally unnecessary addition to the capital on which the telegraph business of the country will be made to pay interest if possible.

"Is there any end to this process? If telegraphs were as costly as railroads it would be too dangerous to tempt even the most daring of speculative capitalists. But telegraphs are easily made without very great cost, and one with a few offices may spoil a good deal of business. The process of constructing new lines for the purpose of compelling the old ones to buy them has been going on with the Atlantic cables down to the present day, with the effect of largely increasing the cost of messages, however it may have been with price so far.

"It is this readiness with which the cost of the telegraph system may be increased by additions which are not needed that gives the chief strength to the scheme for a government telegraph. The dangers of a corporate monopoly may be more considered by the community, but they are less than the dangers of competition in the form which it so frequently takes in telegraph business."

The Winter Grain Movement.

There was doubtless some disappointment with the fall grain movement by those who concluded that a good harvest last summer must make it large, forgetting how important a part of it is usually corn, and that there could be no new corn shipped in the fall. And, finding that the fall movement had not met expectations, some thought that there was a great over-estimate of the crops, and that the winter movement would be light also. Again, they failed to appreciate the influence of the new corn movement, which began unusually early, in December. The result for the months of December and January (nine weeks ending Feb. 3) may be seen in the following table, which shows the receipts and shipments of grain of all kinds (but not flour) at the eight Northwestern markets of St. Louis, Peoria, Chicago, Milwaukee, Duluth, Detroit, Toledo and Cleveland, and the receipts at the seven Atlantic ports for the two months for ten successive years, as reported by Mr. E. A. Walker, Statistician of the New York Produce Exchange:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1873-74.....	26,325,261	12,010,012	17,850,573
1874-75.....	13,684,488	6,761,890	13,572,869
1875-76.....	20,913,672	9,295,360	15,838,748
1876-77.....	20,368,292	8,990,745	16,422,984
1877-78.....	23,365,040	13,536,554	28,555,582
1878-79.....	29,531,539	12,437,646	24,969,849
1879-80.....	33,022,151	10,743,373	28,823,286
1880-81.....	31,333,034	14,567,242	25,758,485
1881-82.....	34,600,717	19,601,312	19,951,397
1882-83.....	41,641,454	21,312,421	25,713,202

We see here that the Northwestern farmers have marketed much more grain this winter than ever before—13,000,000 bushels (36 per cent.) more than last year, when the quantity was greater than ever before. The increase in flour receipts, it may be said, is even greater in proportion, so that there has been beyond question a wholly unexampled grain movement this winter.

The shipments of these markets were also larger this year

than ever before, but only 6½ per cent. more than last year, when they were stimulated by the extremely low rates of the railroad war, which were not one-half so great as this year, so that the earnings from these shipments must have been about \$256 this year for every \$100 last year. It will be noticed that the receipts exceeded the shipments by 20,300,000 bushels this year against 14,600,000 last year, and 16,800,000 the year before. This probably does not signify an unusual accumulation of stocks for shipment, but rather the larger Western consumption and the replenishment of the local stocks—at granaries of street-car companies, teamsters, etc.—which had become very small because of the great scarcity of corn. In fact, the stocks in elevators are not large, and we may not expect that there is now an unusual stock to go forward of what has already arrived. The shipments to the East for the rest of the winter will depend mostly on the arrivals from the West.

The Atlantic receipts this winter, though 52 per cent. more than last year, were about the same as the year before and about 3,000,000 bushels (11 per cent.) less than in 1878 and 1880. This again is explained by the greater domestic consumption. Last year an unusually large proportion of the grain was absorbed before it reached the seaboard, and we exported but little, so the seaboard receipts were limited. The interior consumption goes on increasing all the time, but in ordinary seasons a considerable part of it is supplied from the Eastern states and the part of the West which does not ship by way of any of the reporting Northwestern markets.

The indications are that the direct shipments by rail, not passing by any of these markets, have fallen off largely within the past two years. We judge of these by the difference between the shipments from the Northwestern markets and the receipts of the Atlantic ports. From 1873-74 to 1876-77 this difference was an excess of Atlantic receipts varying from 5,840,000 to 7,430,000 bushels. Since then the excess of Atlantic receipts over Northwestern shipments has been:

	Excess of Atlantic receipts.	P. c. of N. W. shipments.	Excess of N. W. shipments.	P. c. of N. W. shipments.
1877-78.....	15,020,000	111.9	.....	.....
1878-79.....	12,530,000	100.7	.....	.....
1879-80.....	18,080,000	164.0	.....	.....
1880-81.....	11,190,000	77.0	.....	.....
1881-82.....	.....	.....	3,010,000	15.0
1882-83.....	4,400,000	20.7	.....	.....

Since 1874 the receipts of the Atlantic ports had been usually nearly twice as great as the total shipments from the eight Northwestern markets, if not more, and in 1879-80 they were two and two-thirds as great. Since that time the difference has been greatly reduced. Last year the Atlantic receipts were over 15 per cent. less than the Northwestern shipments; but that was plainly due to the light crops and the consequent great falling-off of exports; but this year, while exports have been large, the excess of Atlantic receipts over the shipments of the Northwestern markets is smaller than in any other year of the ten except last year.

This change is an important one for the carriers, for the through shipments not reported at the Northwestern markets are an exclusively railroad traffic. But this through movement is not measured by any of the figures reported. We know it is at least equal to any excess of Atlantic receipts over shipments from the reporting Northwestern markets, but is greater than this excess by (1) the shipments from the reporting and (2) the shipments from the non-reporting markets that do not reach the seaboard, and of neither of these do we have any record.

To show the course of the Northwestern receipts from December to January in the several years we give the average weekly receipts in each of these months, as follows:

	1880-81.	1881-82.	1882-83.
December.....	4,088,968	3,183,985	5,234,697
January.....	2,965,676	4,372,955	4,140,533

The exceptionally large receipts this winter, therefore, were in December. In 1881 receipts were naturally very light in that month. That they were large in the January following was due to artificial causes—to high prices caused by speculation and by the knowledge that the cost of transportation to the East would soon be increased from about 6 cents a bushel to 12 or 15 cents. In 1880-81 receipts were lessened in January by snow blockades in the Northwest, which were quite as bad as any this year and began much earlier. The January receipts in 1880, when the weather was favorable and crops larger than they have been since, but when the rail rate to the East was higher than for some time before or at any time since, averaged 3,523,800 bushels per week—one-seventh less than this year.

Foreign Railroad Notes.

The Belgian Minister of Finance recently submitted the following statement of the average yearly net earnings, the charges for interest, rentals, etc., and the excess or deficit of each period of five years since 1852, together with estimates of the results for three years, as follows:

	Net earnings.	Interest and other charges.	Profit.
1853 to 1857.....	\$1,967,267	\$1,549,552	\$417,715
1858 to 1862.....	2,710,741	1,853,393	857,348
1863 to 1867.....	2,917,988	2,127,344	790,644
1868 to 1872.....	3,432,738	2,635,176	797,562
1873 to 1877.....	4,005,684	5,276,201	Loss, \$1,270,517
1878 to 1882.....	7,789,329	8,601,532	Loss, \$812,203
Estimates:			
1883.....	8,020,000	9,604,054	Loss, 1,584,054
1884.....	8,320,000	10,208,692	Loss, 1,888,692
1885.....	8,620,000	10,634,898	Loss, 2,014,898

The fixed charges are growing so much faster than the profits that there is a larger and larger loss probable yearly. This is likely to be the case with a state railroad system, especially if the government yields to popular pressure for new railroads in districts where traffic is light. The people in such districts cannot get a railroad that will not pay built

by a corporation, but with a judicious exercise of political influence it can get one of the government. There is also always a strong effort made to reduce rates, and it is almost impossible to advance them, however insufficient profits may be. Finally, of course, the tax-payers foot the bill.

The French Minister of Public Works, Dec. 7, issued a circular to the railroad companies with regard to the use of continuous brakes, which a notice given more than a year before intimated would be required for all trains that should run as fast as forty miles an hour. The new circular says that it had been discussed whether, for the sake of facilitating interchanges of cars, it would not be best to require all the roads to use one kind of brake. This, the Minister says, will not be required. The circular further says that several companies prefer the Westinghouse brake, but that the Westinghouse Company has so many orders that it cannot deliver the apparatus in time. On this account the management of the state roads and the Orleans Company have turned their attention to a new compressed air brake known as the Wenger brake, and further comparative tests of this and the Westinghouse brake would be made. The Wenger, it is said, is continuous and automatic, and can be used in combination with the Westinghouse brake, with which the greater part of the equipment of the Orleans road is already provided. The ministerial circular closes with the requirement that within a year the express trains of all the roads must be provided with brake apparatus of some system which will fill the following requirements: 1. The brake must be continuous in the sense that brakes can be applied to all the wheels in the train; 2. It must work automatically, and be so arranged that it can be applied either from the locomotive or from any car.

The International Sleeping Car Company made its first trial of a through train between Paris and Vienna Oct. 10, when a train left Paris at 10:40 p. m. for Vienna, and arrived at Paris on the 14th at 8 p. m., having made the trip either way in 28 hours, the distance by the route followed being 847 miles, and the average speed per hour 30¼ miles. The regular trains require 33 to 34 hours for the trips. There were four sleeping cars, one restaurant car and two baggage cars in the train. Three of the sleeping cars had six wheels, had 14 berths each and weighed 33,000 lbs.; the other was on two four-wheeled trucks, had berths for 16 and weighed 46,400 lbs. The whole train weighed 118 tons and had accommodations for 58 passengers. The cars have end entrances and a side passage instead of a central one like American cars. The cars are heated by a hot-water apparatus, which seems to be a Baker heater. Altogether it seems very like an American train. The berths, however, are in compartments opening from the side passage, some of which compartments have four but most only two berths each, which run across the car, and not lengthwise. The compartments, or state-rooms, are about 5 ft. 8 in. wide for those with two berths, and 7 ft. for those with four berths. This gives room to stand and undress and dress alongside the made-up berths. The train is made up with one baggage car ahead, then two sleeping cars, the restaurant car, the other two sleeping cars and the other baggage car at the tail of the train. The smaller sleeping car bodies are 33 ft. 6 in. long by 9 ft. 4 in. wide, the larger one, 41 ft. x 9 ft. 4 in. The platforms increase their length 4 ft. 8 in., and 5 ft. respectively.

The gain in time made by this train was chiefly by omitting stops and shortening those formerly made at eating stations, but partly by faster running.

The Prussian state railroads and the Austrian railroads which connect with them have for some time had a controversy as to through rates, which has seriously interrupted traffic. The Austrian roads carry a great deal of Austrian produce (chiefly grain and timber, we believe) northward if there are low through rates, and these were made until recently, when the Prussian roads advanced the through rates more nearly to the level of the local rates, this being, we believe, done as a measure of protection to Prussian producers of the articles exported from Austria. The Austrian roads thereupon made connection with lines of vessels navigating the Elbe, and improved the service on this stream. The German roads have suffered considerably from this. They now propose a settlement, with the following as the chief conditions:

1. All freight rebates of the Austro-Hungarian roads in the through freight lines between Austria Hungary and North Germany, Belgium and Holland and North Sea ports, made in connection with the water routes, must be allowed to all the railroads in these lines also.
 2. All rebates of this kind must be made public by the Austro-Hungarian roads, with the announcement that they are the same by all routes. Unless agreement is made beforehand with the German roads to share in these rebates, the Austro-Hungarian roads must pay the whole amount on the through shipment.
 3. Rebates allowed on shipments to points not on the through freight lines (Verbände), whether reached by rail or by rail and water, must in no case make the rates lower than line rates.
 4. Rebates granted by the water route connecting with the Austrian roads must not be paid in whole or in part by the Austrian railroads.
- If rebates are made for a given quantity shipped, the quantity for which the rebate is granted must be the same by the through rail line as by the rail and river line, and if it goes by both routes, then the total shipped by both routes must give right to the rebate by rail as well as river.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Georgia Pacific.—The track from Anniston, Ala., has been extended east 7 miles. Track is laid also on the *Air Line Connection* near Atlanta, Ga., 4 miles.

Meherrin Valley.—Completed from Margarettsville, N. C., northwest to Warrens, Va., 4 miles.

Natchez, Red River & Texas.—Extended west to Cross Bayou, La., 3½ miles.

Norfolk & Western.—The *New River Division* is completed to a point sixty-eight miles northwest from New River, Va., an extension of 9 miles.

Pensacola & Atlantic.—Completed by laying track from Ponce de Leon, Fla., east to the Choctawhatchie River, 8 miles, and from Marianna, Fla., west 17 miles.

Union Pacific.—Track on the *Oregon Short Line* is extended from Kimama, Idaho, west to Shoshone, 32 miles.

This is a total of 84½ miles, making 163 miles thus far reported for 1883, against 311 miles reported at the corresponding time in 1882, and 173 miles in 1881. The weather thus far this year has not been favorable for tracklaying.

CHICAGO THROUGH RAIL SHIPMENTS EASTWARD for the ten days ending Jan. 31 were 67,544 tons, of which 10.1 per cent. went by the Chicago & Grand Trunk, 24.8 by the Michigan Central, 24.3 by the Lake Shore, 21.1 by the Fort Wayne, 7.7 by the Pan-handle and 12 per cent. by the Baltimore & Ohio. Thus 49.1 per cent. of the whole went by the Vanderbilt roads, against 45.5 in the pool, and 28.8 by the two Pennsylvania roads, against 35.5 in the pool.

The shipments of these last ten days of January were at the rate of 45,029 per week, and the shipments for the last week of January for four successive years have been:

	1880.	1881.	1882.	1883.
Tons.....	41,775	65,873	80,525	45,029

Thus the shipments this year were 44 per cent. less than last year, 31½ per cent. less than in 1881, and 8 per cent. more than in 1880.

The shipments of the week last year were among the largest ever made, but probably at the lowest rates ever received.

For the whole month of January the total Chicago through shipments for five successive years have been, in tons:

1879.	1880.	1881.	1882.	1883.
192,512	163,378	263,872	321,148	253,135

The new Nickel Plate road has carried some freight this year, not included above, but probably not 10,000 tons. The month's shipments this year were 21 per cent. less than last year, 4 per cent. less than in 1881, 55 per cent. more than in 1880, and 31 per cent. more than in 1879. If all the freight had gone through to New York the earnings from it in these years would have been:

1879.	1880.	1881.	1882.	1883.
\$962,562	\$1,307,024	\$1,846,104	\$642,296	\$1,518,810

The earnings this year have thus been exceeded in but one other year. These figures are in excess of the actual earnings, because some of the freight did not go so far as New York, but they must have been nearly in proportion to the actual earnings, and not very much in excess of them.

For the week ending Feb. 7 the total Chicago shipments for the past four years have been:

	1880.	1881.	1882.	1883.
Tons.....	38,490	53,209	73,425	43,388

Last year the shipments of the week were 41 per cent. less than last year, 18 per cent. less than in 1881, and 12½ per cent. more than in 1879. Of the shipments of this week 14 per cent. went by the Chicago & Grand Trunk, 24.9 by the Michigan Central, 20.6 by the Lake Shore, 21.7 by the Fort Wayne, 11 by the Pan-handle, and 7.8 per cent. by the Baltimore & Ohio.

The decrease in shipments since December is as noticeable as the increase after November. The average weekly shipments in October were 34,515 tons, in November 50,009, and in December 63,259. The actual shipments each week since December have been, in tons:

Jan. 7.	Jan. 14.	Week to Jan. 21.	Jan. 31.	Feb. 7.
65,900	66,034	53,657	45,029	43,388

Part of the decrease of shipments since the first half of January is doubtless due to the snow blockades on some of the Northwestern roads, but perhaps not the whole of it. Last year the shipments decreased rapidly after January, and after the middle of March they never reached 40,000 tons in any week until November.

The railroad companies have begun making the weekly reports of shipments of flour, grain and provisions which were formerly made by the several roads to the Board of Trade and compiled by it. These reports differ in several particulars from those above, which include the through east-bound freight which the railroads divide; but although they include shipments to local points on the Eastern roads (which are not covered by the pool and not reported above), they are usually much less than the aggregate of through shipments covered by the pool. For the week ending Feb. 10 the shipments reported were 4,974 tons of flour, 20,327 of grain and 9,040 of provisions, a total of 34,341 tons, against 45,051 tons the week before and 55,576 in the corresponding week of last year.

AMERICAN PIG IRON PRODUCTION, which affords many railroads a very large share of their traffic, and to some, as to the Lake Superior ore-carriers, is the sole cause of their existence, is reported by Mr. Swank, Secretary of the Iron and Steel Association, to have been 4,623,323 tons of 2,240 lbs. in 1882, and 479,069 tons, or 11½ per cent. more than in 1881. There is scarcely any other industry which requires so much transportation—the ore weighing probably one-half more than the product, the fuel about as much

as the ore, the limestone for flux another large amount, and all before the heavy product is ready for distribution. The amount of transportation of course depends chiefly on the nearness of the furnaces to the fuel and ore. Most of them are quite near their fuel; but to furnaces at Chicago and Joliet coke is brought from Connellsville, and ore from Lake Superior; and the growing use of coke for smelting has resulted in conveying it hundreds of miles to furnaces that formerly used raw coal. The Lake Superior ore goes to furnaces nearly a thousand miles distant, but the transportation is mostly by lake. Such roads as the Cleveland & Pittsburgh, the Pittsburgh & Lake Erie, the Cleveland & Mahoning line of the New York, Pennsylvania & Ohio, the Erie & Pittsburgh, the Pittsburgh Division of the Baltimore & Ohio and some others depend on the prosperity of the iron industry to a very great extent and suffer greatly when that business is prostrate, as they flourish greatly when it is as active as for the past three years. For five successive years the pig-iron production has been:

	1878.	1879.	1880.	1881.	1882.
Bituminous..	1,063,475	1,284,802	1,741,255	2,025,236	2,176,855
Anthracite..	975,777	1,136,059	1,013,974	1,548,627	1,823,351
Charcoal....	201,663	320,422	479,962	570,391	623,130

Total..... 2,301,215 2,741,853 3,835,191 4,144,254 4,623,323

Thus the total production has doubled since 1878. For five years before 1878 it had been almost stationary, falling from 2,543,710 tons in 1872 and 2,560,982 in 1873 to 1,851,104 in 1876.

The increase since 1878 has been considerably greater in bituminous than in anthracite pig—105 per cent. in bituminous and 87 per cent. in anthracite; but at a still more rapid rate in charcoal iron—no less than 138 per cent. From 1880 to 1881 there was even a decrease of 65,347 tons in anthracite pig, while there was an increase of 283,981 in bituminous. Last year, however, it was the anthracite furnaces that made the most progress, increasing their product 274,711 tons, while the bituminous furnaces gained but 151,619. Until 1875, more pig iron was smelted with anthracite than with bituminous coal—in 1874 132 tons by anthracite to 100 by bituminous; in 1868, 241 to 100; in 1864, 326 to 100; in 1881, only 77 to 100; last year, 84 to 100. With the growth of population in the West, furthest from the anthracite mines and nearest to the Lake Superior ore, it is to be expected that the bituminous furnaces will multiply fastest.

It has been said that the business of the anthracite coal railroads is threatened with prostration by depression in the iron industry. But at the liberal allowance of 1½ tons of coal to 1 of pig the consumption of anthracite in blast furnaces last year, when it was largest, was 2,735,000 tons, out of a total production of 29,000,000. Moreover, the blast furnaces that use anthracite are mostly close to the mines, require little carriage of coal, and get it a price that leaves less profit than the average. So far as the demand for anthracite coal is concerned, a slackening of iron production will not have an important direct effect. As one of the manifestations of a general dullness of business, it is much more important.

THE DESTRUCTION OF FORESTS FOR TIES is the theme of a newspaper writer who seems to have depended upon his imagination for his facts. At this date there are about 142,000 miles of railroad track in the United States, including second tracks and sidings. These generally have 2,640 ties per mile—very rarely more. At this rate there are 375,000,000 ties in the country. The imaginative statistician says that the ties would make a pile 4 ft. x 4 ft. and 4,575 miles long. But 375 millions of ties would make the pile more than 13,000 miles long. He says that placed end to end the ties would girdle the earth at the equator 15 times. In fact they would extend about 625,000 miles, or 25 times the length of the equator. But our statistician, having a too-restrained imagination so far, makes up for it by extravagance in estimating the consumption of timber for ties. The number of trees required yearly for renewing ties is given as 50,000,000. With an average life of six years, which is probably not extravagant, about 63,000,000 new ties—not trees—are required for renewals, and it is to be hoped that we can get more than 1½ ties per tree. These 50,000,000 trees are said to cover 3,000,000 acres of land—which gives an average of 16½ trees per acre. It would hardly be called a forest that was no thicker than that, especially if the trees were only large enough for 1½ ties apiece. Doubtless a great deal of woodland may supply no more, but then there is left on it a great deal more growing timber, which will soon make ties, or larger timber, which is worth more for something else, and in such cases the 16½ ties cannot be said to "require" the acre of ground. The 3,000,000 acres of land are said to be at the rate of 2,500 acres for every mile of railroad track. This would be equal to a strip of forest nearly four miles wide along the whole length of a railroad simply to provide it with ties—eight miles wide for a double-track road. For the railroads of Massachusetts, according to this, there would be required the whole area of the state and nearly as much more somewhere else to keep them in ties! In the state of New York, five-sixths of the area of the state would be so required. But, in fact, we find that 3,000,000 acres of land are not 2,500 acres per mile of railroad track, but only about twenty-one acres—not a strip four miles wide along every track, but one only 10½ rods wide.

Allowing an average life of six years for ties, one row of trees large enough for two ties each, one rod apart alongside a track, would last a year and a half. The number of rows required to keep up the supply would depend, of course, on the length of time required to grow to that size. If this time were twenty years even, then 40 acres of land per mile

of track would suffice—a strip 20 rods wide—affording an average annual yield of 5½ two-tie trees per acre, and of course a good deal of firewood. Perhaps this is an extravagant yield to expect; we have no sufficient information as to the results of forest culture. But it is questionable whether it would pay to devote good farm land to the purpose if the yield should be less. Interest would count up to something tremendous before the first crop could be harvested. Money put into plant for preserving ties is likely to pay better, though this will still leave it desirable to preserve our forests and to plant trees in places where they will thrive.

THE PROSPECTS FOR SUMMER TRAFFIC FROM THE NORTHWEST depend upon many things, not the least of which is the competition of the lake vessels. Last year, though rail rates were firmly maintained at 25 cents per 100 lbs. from Chicago to New York while navigation was open, the lake competition was less than usual, and the railroads carried a proportion of the grain—for which alone the vessels compete—larger than ever before, except when they have carried for less than cost. The lake rates were low, but not so low as they have been in some other years, and the vessels seemed less inclined to accept a low rate when necessary to divert shipments from the railroads.

This was probably in large part due to the exceptionally large demand for vessels to carry Lake Superior iron ore to lower lake ports, and to the heavy lumber trade. The latter does not take many vessels fit to carry grain, but it does use some that are fit to carry ore, and last year many grain carriers were in the ore trade. Now, should there be a falling-off in the demand for ore, there will doubtless be more vessels in the grain trade next season, so that the rates and traffic which the railroads will be able to secure depend somewhat on the activity of the blast furnaces. There is said to be an unusually large stock of ore on hand and at Lake Erie ports, but some of the furnace men and the producers of ore generally are said to be confident of a large iron production this year. This is possible, especially if prices remain low and imports are reduced; and it is possible that the Lake Superior ore production will keep up even if the iron production is reduced, as the tendency is to use more and more the kind of iron which this ore makes, and a considerable fall in prices might give it fuller command of the market than it now has. The probability is, however, that fewer vessels will be required in the ore trade than last year, and that therefore there will be more offering in the grain trade. As there is very much more grain to go forward, however, the railroads will probably have at least as much to carry after navigation opens, and we should say that they will be likely to get so much at a 25 cent rate, whatever the lake competition, that they will not need to accept any lower rate.

THE NORTHERN CENTRAL RAILWAY has made greater progress of late years than almost any other Eastern road. For nine successive years its gross and net earnings and working expenses have been:

	Gross earnings.	Expenses.	Net earnings.
1874.....	\$4,676,501	\$3,382,554	\$1,293,947
1875.....	4,926,248	3,361,124	1,464,123
1876.....	4,369,926	3,242,326	1,427,600
1877.....	4,010,383	2,745,925	1,324,458
1878.....	3,723,457	2,604,497	1,118,960
1879.....	4,107,949	2,601,942	1,246,007
1880.....	5,050,387	3,235,288	1,795,119
1881.....	5,433,700	3,787,446	1,656,254
1882.....	5,800,176	3,842,323	1,957,853

This road thus made in 1882 an increase of \$366,476 (6½ per cent.) in gross earnings over 1881, of \$54,877 (1½ per cent.) in working expenses, and of \$301,599 (18½ per cent.) in net earnings.

The rate of increase in gross earnings is not nearly so great as on the Pennsylvania Railroad (6½ per cent. against 11½), but instead of the enormous increase of 14½ per cent. in working expenses on the Pennsylvania, the Northern Central had but a trifling increase, the result being that the Northern Central had a great increase in net earnings (18½ per cent.), while the Pennsylvania had the comparatively moderate one of 5½ per cent. The progress of the Northern Central since 1878 has been extraordinary. The increase has been 46 per cent. in gross and no less than 73 per cent. in net earnings. In the same time the Pennsylvania increased its gross earnings 55 per cent., but its net earnings only 40 per cent. The increase last year on the Northern Central was equivalent to 4.64 per cent. on the stock; the increase over 1878 has been nearly 13 per cent. on the stock. The Northern Central is the chief carrier of anthracite coal to Baltimore, and in some years carries to that port nearly half its receipts of grain; the latter, however, it carries for the most part over only 85 miles of its 322 miles of road. Its business probably depends more on the activity of the manufacturing districts through which it runs than on the through traffic. Its earnings per mile were \$18,013 last year, against \$17,878 on the "Main Stem and Branches" of the Baltimore & Ohio, which, however, has much the larger proportion of branches. The Northern Central evidently has become an important road.

THE SUEZ CANAL TRAFFIC grows with very little interruption, and was twice as great in 1882 as in 1879. The number of vessels passing through, which was 486 the first year the canal was open, increased to 1,082 in 1872, to 1,494 in 1875, to 2,026 in 1880, and to 3,198 in 1882. From 1875 to 1879, inclusive, the traffic was nearly stationary. The English campaign in Egypt last year added somewhat to the traffic. A dividend of 13.7 per cent. on the shares was paid from the traffic of 1881, and last year's traffic will warrant the paying of about 20 per cent., it is said. The gross receipts last year were about \$12,000,000. By an agreement heretofore made the toll was reduced

half a franc a ton at the beginning of this year; this on last year's tonnage would have reduced the receipts nearly \$700,000.

The average tonnage of vessels passing through the canal increased rapidly in the first five years after the opening—from 897 tons in 1870 and 905 in 1871 to 1,980 in 1874. Since 1874, however, there has been little variation in the average capacity of the vessels that use the canal, the largest average being 2,191 in 1879, and the average in 1882 being 2,130 tons. This is probably because small vessels cannot profitably engage in the trade that passes through the canal, and the largest ones, such as are now built for the transatlantic trade, cannot get through it.

The profitability of this enterprise doubtless encourages the promoters of the Panama Canal; but there is no such traffic to cross the American isthmus as that between Europe on one hand and China and India on the other, with hundreds of millions of people on each side of the route, which forms the shortest connection between them. The whole tonnage passing the Suez Canal last year was 6,811,521, which paid tolls at the rate of about \$1.70 per ton.

THE EFFECT OF THE SNOW BLOCKADES is plainly seen in the earnings of the Northwestern railroads. The three which are probably most affected report for the first week of February:

	1883.	1882.	Decrease.	P. c.
Chic., Mil. & St. Paul.....	\$214,000	\$352,649	\$138,649	39.0
Chic., St. P., Minn. & Oma.	46,200	73,600	27,400	37.0
Chic. & Northwestern.....	257,000	377,400	120,400	32.0

This does not tell the whole story, however, for these companies are all working a considerably larger mileage this year, and their average earnings per mile show the following changes:

	1883.	1882.	Decrease.	P. c.
Chic., Mil. & St. Paul.....	\$48	\$86	\$38	44.0
Chic., St. P., Minn. & Oma.	40	73	33	45.0
Chic. & Northwestern.....	72	121	49	40.5

Some branches are entirely abandoned at such times, though these are lines with light traffic and earnings, the very infrequency of the trains making it almost impossible to keep them open, as if one train gets through before another is due the track is often blocked as badly as ever. A greater loss in earnings is on the more important lines, where, even if the trains all succeed in getting through, often less than half the usual number of cars can be hauled. That is, even if by sufficient force the trains could all get through, the motive power of the road may be only sufficient to move half of them. The expense of these blockades is great, but the earnings are not so much lost as postponed, as the traffic will all come around finally. For this reason the roads east of Chicago which are not blockaded may suffer more in earnings from the blockade than the Western roads. The latter will bring forward hereafter the produce they are unable to bring now; but unless they get it to Chicago before April, the lake vessels will get a large share of it; while the winter arrivals will be mostly forwarded to the East by rail. We already see this in the falling-off of Chicago shipments.

THE NEW YORK RAILROAD COMMISSION has organized by choosing Mr. Kernan Chairman, and has announced, probably for the benefit of the waiting hundreds of aspirants for the position and the \$3,000 salary of Secretary of the Board, that it deems it desirable that this official shall have "practical experience in the method of bookkeeping used by railroads in the freight and passenger transportation business," and that it will not make an appointment to the place at present. It certainly is almost indispensable to the intelligent conduct of its business that there should be some one attached to the Commission having this knowledge. The Commission will have to make the state railroad report, and without a knowledge of railroad accounts, and a very sharp exercise of it in prescribing what is meant by the various requirements in the form of reports, and watching to see that they are properly filled, it will never make a trustworthy report. The lack of this special knowledge has made the statistical part of most of the state railroad reports almost valueless. It will be possible to get an efficient man for the place, if regard is had simply to qualifications for its duties; and any other than a person experienced in railroad accounts, while causing great and useless trouble to the railroads (by not knowing what to ask for when information is wanted), will not be able to secure the information desired, either for the regular annual railroad reports or for special investigations.

THE SCRAP HEAP.

Locomotive Building.

The Manchester Locomotive Works in Manchester, N. H. are completing an order for 20 locomotives for the Oregon Railway & Navigation Co. These engines will be shipped by sea to Portland.

The Baltimore Manufacturers' Record of Feb. 10 says: "Some time ago we mentioned the removal of the large locomotive and machine works of T. H. Paul & Son from Frostburg and Cumberland, Md., to this city. Messrs. Paul & Son have erected large buildings near Riverside Park, and expect to turn out locomotives complete, if the demand requires it; and if it does not, they will engage in the manufacture of stationary engines and repairs of all kinds, and, in fact, will conduct a general machinery and machine-repairing business, having all the facilities requisite for such. Within the last two years this firm have done a very extensive business in Cuba, and also for the Austin & Northwestern Railroad and the Pittsburgh & Western Railroad. The foundry, which is to be 160 by 55, and the office 55 by 21; the storeroom to be back of the office and the drawing room to be above the office; the carpenter shop to be 40 by 60, and the pattern shop above the carpenter shop, are not erected yet, but the ground has been broken, and as soon as weather permits, work will be commenced on all them. The erecting shop has been completed and a railroad track laid through it; the

foundry proper will probably not be ready for occupancy until May, but in the meantime the temporary foundry will be used. It is intended to start the works up next week for the purpose of getting all the machinery into good running order, but regular business operations will hardly be commenced for about three weeks yet. Among some of the machinery that has arrived and been placed in position may be mentioned a vertical drill, a very powerful hydraulic press, and an immense planer for planing iron, from the Betts Machine Works, Wilmington, Del.; a 3,000-lbs. steam hammer, from Messrs. Merrick & Sons, Philadelphia; quartering machines, from Sellers, Philadelphia, and a steam punch and shears from the Lambertville Iron Works. A great deal of heavy machinery and machinery of all descriptions has been ordered, but has not yet arrived. Messrs. Paul & Son are now building at the Mt. Savage Works a narrow-gauge engine, 15 by 28 cylinder consolidation, and have orders for four more of the same pattern. They have also a very fine engine, turned out at the Mt. Savage Works, on hand, to which they are making some necessary alterations at their new works."

The Rhode Island Locomotive Works of Providence, R. I., are very busy, 1,000 men being employed, and the works are running over-time. They have orders on hand from the Chicago, Milwaukee & St. Paul; Chicago, St. Paul, Minneapolis & Omaha; Mexican Central; St. Paul, Minneapolis & Manitoba; Canadian Pacific; Boston & Providence; New York, Providence & Boston; Southeastern of Canada, and others.

Car Notes.

The Allen Paper Car Wheel Co. has just closed a contract to furnish steel-tired paper wheels for all the passenger equipment of the Northern Pacific road, and for the engine and tender trucks.

The Milton Car Works at Milton, Pa., are very busy, with orders on hand which will take several months to fill.

Bridge Notes.

The Berlin Iron Bridge Co. at East Berlin, Conn., has taken a contract for an iron highway bridge in Cunningham, Mass. The officers of this company (late the Corrugated Metal Co.) are: S. C. Wilcox, President; Charles M. Jarvis, Vice-President and Chief Engineer; Charles H. Holister, Secretary and Treasurer. Last year the company built 11 spans of railroad bridge and 89 of highway bridge.

The Edgemoor Iron Co. near Wilmington, Del., has completed its contract for furnishing material for the superstructure of the New York and Brooklyn (East River) bridge.

The Atlanta Bridge & Iron Works of Wilkins, Post & Co., in Atlanta, Ga., have now under contract 7 combination spans over Coosa River and one over Ochatie River for the East & West Railroad, of Alabama; one iron span over Caliber Creek and one steel span over Red Creek for the Western, of Alabama; three iron spans over Flat Creek for the Atlanta & West Point; two iron spans, highway bridges, of 130 ft. each; two wrought-iron turn-tables for the Richmond & Danville Extension, one for the Western, of Alabama, and one for the Cherokee road.

Iron Notes.

The American Iron & Steel Association has received reports from all the makers of pig-iron in the United States, and officially announces that the quantity of pig-iron made in 1882 was 4,623,323 tons, which is nearly 500,000 tons more than ever before made in one year in this country. The production of 1881 was 4,144,254 tons. The production of the different kinds of pig-iron in 1881 and 1882 was as follows in gross tons:

	1882.	1881.	Increase.	P. c.
Bituminous and coke.....	2,176,855	2,025,236	151,619	7.5
Anthracite.....	1,823,338	1,548,627	274,711	17.7
Charcoal.....	623,130	570,391	52,739	9.2
Total.....	4,623,323	4,144,254	479,069	11.6

The stock of pig-iron held unsold in the hands of makers at the close of 1882 was 383,655 tons. At the close of 1881 the stock on hand was 188,300 tons.

The stockholders of the South Tredegar Iron Works in Chattanooga, Tenn., have voted to increase the capital stock to \$200,000, the new stock to be used in enlarging the works, which make nails, spikes, bolts and rail-splices.

Callia Furnace in Botetourt County, Va., has been repaired and improved and will very soon go into blast.

The Lucy-Selina furnaces of the Longdale Iron Co. in Alleghany County, Va., are in blast. The two stacks made about 25,000 tons of pig iron last year.

Amberst Furnace in Amberst County, Va., has gone out of blast for repairs, after a long run.

Liberty Furnace in Shenandoah County, Va., made last year 2,236 tons of cold-blast, charcoal, car-wheel iron; the furnace is still in blast.

The Bay State Iron Co., which has rolling mills in South Boston and blast furnaces at Port Henry, N. Y., has suspended payment. The liabilities are estimated at \$650,000. The stockholders have voted to wind up the business and sell the property.

Irontdale Furnace in Preston County, W. Va., last year made 8,500 tons of pig iron, using local ores and coke for fuel. The furnace is still in blast.

The trustees of the estate of Andrew Kloman, deceased, manufacturer of steel and iron structural material, have issued the following circular: "Owing to a combination of unfortunate circumstances this estate has become embarrassed financially in the conduct of its business. A meeting of creditors will be held on Friday, Feb. 16, at 2 o'clock p. m., at the office of S. Schoyer, Jr., 139 Fourth avenue, Pittsburgh, to receive the statement of the trustees and determine upon some course of action. You are earnestly requested to be present in person or to send a representative empowered to act."

Manufacturing Notes.

The Westinghouse Air Brake Co., of Pittsburgh, has arranged to take the exclusive charge of manufacturing and selling the metallic packing of the United States Metallic Packing Co., of Philadelphia, for use on railroads. The Westinghouse Co. will also receive orders for metallic packing for stationary and marine engines, steam-hammers, etc. The United States Metallic Packing Co. agrees to protect all purchasers of this packing, and to uphold its exclusive right to furnish it by such legal proceedings as may be necessary.

The Union Stone Co., of Boston, has lately completed its new factory, and is receiving many orders for the solid emery wheels of 42 in. diameter and 4½ in. face, which are made to take the place of grindstones. These wheels can be run without using water.

The St. Louis Iron Boat Building Co. is building a number of barges for the Mississippi River, and a dredge-boat for use on the Ohio. The company is making arrangements to build composite boats, with iron frames and wooden planking.

The Lambert & Bishop Wire Fence Co. in Joliet, Ill., has had plans prepared for a new mill, and will soon begin on it.

The Rail Market.

Steel Rails.—The market is unsettled a little and sales are reported at \$39 to \$40 per ton at mill, with one or two large lots placed at something below \$39.

Rail Fastenings.—Spikes are quiet at \$2.80 per 100 lbs. Track-bolts are still quoted at \$3.50 to \$3.75 for square nuts, and \$3.75 to \$3.90 for hexagon. Splice-bars or fish-plates, 2½ to 2¾ cents per pound.

Old Rails.—Small sales of old American iron rails are reported at \$36.50 to \$37 per ton in Philadelphia. There is no active demand.

The International Electric Exhibition in Vienna.

The English Society of Telegraph Engineers and Electricians has formed an executive committee for the purpose of managing all affairs concerning the representation of England at the coming International Exhibition in Vienna. This committee will receive all the applications of English firms and individuals for space, and will generally attend to English interests there.

Strict Discipline.

According to the Worcester Spy, Luke Stearns, the oldest engineer on the Boston & Albany Railroad between Worcester and Albany, who has been in the service more than 35 years, about 30 years of which he has run the morning accommodation train from Springfield, arriving in Worcester at 9:25, has been laid off, probably for good. He failed to see the signal at the Palmer "Know-nothing" crossing on the morning of Feb. 2 and ran into a freight train on the New London Northern road. The damage amounted to less than \$50, and it was his first offense, but the officials of the road held him to a strict accountability, and the accident cost him his position. Another engineer on the Boston & Albany road, who was recently promoted from an accommodation train to a fast express, failed to make time and has been put back to his old place. Superintendent Barnes happened to be riding on his train one day and noticed that the speed was irregular, fast down hill and slow up. As the new and heavy passenger locomotives are constructed with the view of climbing the hills at a good rate of speed, so that they may be eased up going down hill and on the levels, thus maintaining a uniform rate of speed, he directed an immediate change of engineers on that train.

The first of these cases will seem to most people pretty hard. Nevertheless it is entirely right, and it is satisfactory to know that, on one road at least, discipline is strictly enforced. Were this the case everywhere, our "Record of Train Accidents" would be much shorter than it usually is.

The First Private Railroad in India.

The first railway constructed in India by private enterprise has recently been opened. The length of the line in all is six miles, four miles from the Baidyanath Junction on the East Indian Railway to Baidyanath (Shrine) station, Deoghur Railway, from where there is a branch to Rohini, two miles. The line crosses a rapid hill torrent, called the Derwah River, which is bridged by a girder bridge of five piers, being a length of 325 ft.; and another girder bridge, 65 ft. long, crosses the Jumna-Jori, a smaller river. During the wet and rainy months these rivers overflow and flood the surrounding country, and render communication almost impossible with the town of Deoghur, where the shrine is situated, but this line will effectually do away with this difficulty. The object of this line is principally to convey from Baidyanath Junction to the shrine of Baidyanath, Deoghur, the enormous number of pilgrims who flock to the temple from all parts of India all through the year, while at certain Hindoo festival seasons the ordinary number is quadrupled. Besides this great pilgrim traffic, which, from the East India Railway statistics, amounts to over 500,000 passengers annually, the same statistics represent an outward and inward freight traffic at the Baidyanath Junction from 6,000 to 7,000 tons yearly. Between the two it is reckoned that the line cannot fail to show good results. The Deoghur Railway has been constructed and equipped at a cheapness of cost never yet rivalled in that country, namely, at under \$20,000 per mile, and this including a large girder bridge. The line has been constructed entirely by Messrs. Burn & Co., without any guarantee, subsidy, or concession whatever from government, further than the grant of the necessary land.

Wire Railway.

A description has recently been given in the German technical press of a wire railway in connection with the coal mining industry established near the Hersteigg, the products of which it brings to the main line belonging to the Southern Railway of Austria. In its alternating rise and fall during its distance of 3,000 yards there is a useful excess of incline of about 142 yards, which, it is said, suffices to keep the line in self-acting working, after it has been started by means of the 12-horse power engine provided for that purpose. When there is no return load to be sent to the mine, the speed of the line can be regulated by a brake. Under these circumstances the cost of working the line is estimated at about 5½ cents per ton of coal. In its general arrangement the railway forms a straight line, and consists of two drawing ropes and the train rope. The line which is used for conveying the coal to the station is 1.10 in. thick, and is composed of 19 steel wires, each 0.18 in. in diameter. The line on which the coal vessels are returned to the mine is only 0.66 in. thick, the 19 steel wires of which it is composed being only 0.13 in. thick. Both ropes consist of wires about 765 yards long, coupled to each other, and for the ropes a breaking strength of 73 tons per square inch section is guaranteed. At the ends of the ropes weights of 5 and 3 tons are applied in the usual way for obtaining the proper tension. The distance between the 17 supports varies from 60 to 400 yards. The train rope is 0.6 in. thick, and consists of twelve soft steel wires of 0.07 in. diameter, and runs at a speed of about 1½ yards per second. The vessels which convey the coal follow each other at a distance of about 83 yards; thus 36 are always on the way to and the same number coming from the station. Each vessel contains about 10 bushels, or about a quarter of a ton of brown coal, the total quantity carried per hour being about 17½ tons. The cost of the line was about \$25,000.

Steam Pressure in Marine Boilers.

The great increase of steam pressure in marine boilers which has been made in recent years and the advantages resulting therefrom are described as follows in an admirable summary of engineering progress during 1882, published in the first number of the London Engineer for 1883:

"There are many steamers now afloat carrying 120 lbs.; few new steamers carry less than 90 lbs. The new Mexican steamers will carry 140 lbs., steam worked in triple expansion engines. It does not appear that there is any economy effected, as far as coal is concerned, by the use of these extreme pressures, but it is found that smaller boilers may be used, which is of considerable importance. With moderate pressures it is very difficult to get dry steam without a very large steam space, and for this reason boilers are made bigger in diameter than they need otherwise be. But with steam of 100 lbs., twice as much of it by weight as of 50 lbs., can be got into a given space. The bubbles rising through the water from the heating surface are also smaller by one half, and the ebullition is less violent; therefore priming is reduced and dry steam is supplied to the engines. The boilers being kept down in diameter no augmentation in the thickness of plates is required. In some cases the two top rows of tubes are suppressed, apparently without detri-

ment to the steaming powers of the boiler; but the tendency is to rather augment than diminish grate surface. So long as the pressure is kept below 120 lbs., or so, there is no more expansion employed than when steam of 80 lbs. was used, and the terminal pressures are accordingly higher, the aggregate result being that out of a given weight of engines and boilers more power is got in very nearly the ratio of the augmentation of pressure. These appear to be the sole gains, and they are well worth having. The supply of dry instead of wet steam, the suppression of priming, and a reduction in weight, are almost invaluable at sea.

Iron-Making in Middle Tennessee.

A correspondent of the Nashville American writes as follows: "Before the war there were in operation in the counties of Middle Tennessee 35 furnaces and forges. Now there is no forge and but 7 furnaces in this vast iron area. The primitive iron makers labored under a great many disadvantages that we know nothing of, yet they made a success of it and built up large fortunes for the rising generations. The steam engine was unknown when our first Middle Tennessee furnaces were built, and many old furnace sites can be found to-day where iron was made through the instrumentality of water power. Forges were run by the same power.

"The furnaces in operation now are as follows: Lagrange, Clark, Bearspring and Dover in Stewart County, Cumberland in Dickson County, Warner in Hickman County and Napier in Lawrence County. This is a great falling off, notwithstanding there has been great improvement in the construction of furnaces, consequently a reduction in the cost of manufacture of iron.

"Nearly all the old furnaces were run by large slaveholders, and some might term it cheap labor, but our labor of to-day is far cheaper than labor was then. A slave was bound to be fed, clothed and doctored at the expense of the owner, and if he died (which, of course, they did as other people do) there was a clear \$500 or a \$1,000 lost.

"The following is a list of the furnaces that have long since blown out:

"In Montgomery County, Louisa, Tennessee, O. K., Yellow Creek, Sailor's Rest and Lafayette.

"In Dickson County, Carroll, Worley, Bellview, and Jackson with a forge at Betts-Town, Barton's Creek and Jones' Creek.

"In Hickman County, Aetna Furnace, Spring Creek and Sugar Creek.

"In Stewart County, Rough & Ready, Poplar Springs, Cumberland Rolling Mills, Hollisters and others.

"In Decatur and Perry counties, Cedar Creek, Shannonsville and Brownport.

"In Wayne County, Marion and Wayne, and several others in different parts of the country that I cannot recall at present.

"Of all the furnaces in Dickson County, old Cumberland is the only one in operation, and it has been in blast almost continually for 40 years, and has made three or four fortunes for its owners, and not because it is better situated than other furnaces in the same locality, but because it was better managed, the secret of success in the manufacture of iron."

A Walking Power for Street Cars.

Another factor has appeared in the attempts to cheapen the cost of running street cars, and thus proportionately reduce the rates of fare. This time it is a motor invented by B. C. Pole, an engineer of large experience in the service of the United States government. The motor does not employ steam, and it weighs only 4,000 pounds, a weight easily carried by the street rail's now in use. The force is derived from an Otto or similar class of gas engine, into which coal gas is fed from a tank or reservoir. After its injection into the engine it is exploded, and this explosion, operating upon a series of pumps or valves, sets in motion the movements of the motor. In the first place, there are two fluid cylinders so arranged as to bring the pressure of the fluid upon a foot, which goes down upon the cobbles between the tracks, making a step of 3 ft. 2 in. in length; and every time this grip-like device, fitted with teeth, and nicely adjusted for securing purchase or hold, makes a step, the motor is propelled or pushed forward 3 ft. 2 in., the steps to be decreased or increased by regulation from the engineer. The foot is padded with rubber, which gives its stroke upon the earth such elasticity that there is no jar or sudden start.

Immediately over the top of the foot as it rests on the earth are two air cylinders connecting with the feet by a swinging shaft. Upon these feet they bear a pressure of 500 pounds. The action of the air and fluid pressure is simultaneous in effect, and when the power of propulsion by the latter has been expended the former lifts the feet, and the counter action of the hydraulic cylinders takes them forward for the next backward or propelling movement. The operation of the machinery is described to be as simple as the movement of an elevator.—Philadelphia Record.

Keeping the Seat.

A few evenings since on the 5:10 P. M. Marietta & Cincinnati train two married ladies who reside on the line of the road had been attending the Opera Festival matinee and doing some shopping, took the train at the Plum street depot, and on getting seated in the car turned over one back of the seat and proceeded to occupy both seats, placing their bundles on the vacant seat, which they would also keep in reserve for the husband of one of the ladies whom they expected to join them at the Eighth street station. The ladies had scarcely seated themselves when a Mr. —, who resides in Clifton, entered the car and took possession of the seat previously taken possession of by the ladies, but not until after he had been informed that the seat was reserved. Mr. —, the alleged gentleman, replied, saying, "I am going to have the seat anyhow," and, suiting the action to the word, sat down. The ladies very properly entered their protest, one of them saying, "No, sir, you cannot occupy that seat," to which he replied, "I shall certainly occupy that seat." The lady again spoke up, saying, "If you occupy that seat I shall relinquish the entire seat."

"Very well," shouted the muscular person, "I will take the whole seat, and you can stand up." At this last remark one of the ladies grew exasperated, and proposed to maintain her rights, and refused to vacate the seat. Finding that he was not to obtain the seat, the male person called to the conductor and demanded of the train's official that he be given that seat. The situation of affairs was explained to the conductor by the ladies, and their action approved by the official, claiming that if the seat was reserved they were entitled to the undisputed possession of the same, and that the man could not occupy it.—Cincinnati Commercial Gazette.

The man upon whom the Commercial Gazette here expends its sarcasm, did certainly, according to the account given, behave in an ungentlemanly way. Nevertheless, so far as his claim to the seat was concerned, he was undoubtedly right, and the conductor was wrong. It is custom—and custom supported, we believe, by legal decisions—that no passenger has a right to keep a seat for another who is expected to come. A seat can be kept for a passenger who has left it temporarily and expects to return to it, but not for one who has never occupied it. In the East, certainly, any conductor

would have told the ladies that they must give up the seat if the other passenger insisted on his rights. A passenger in a similar case entering a crowded car in New York, for instance, might leave the ladies undisturbed from a natural dislike to any controversy with a woman, but a man would not be permitted to make such a claim to a seat for an instant. And no one fairly claiming to be a lady would attempt to keep a seat when the cars were full.

An Electrical Railroad in Ireland.

The Portrush tramway is an accomplished fact. It has been built in the old-fashioned way by a company of shareholders, who raised £45,000 in £10 shares, to construct six miles of rail. Being worked by electricity, there is no necessity either for the heavy railway needed to support the weight of a steam engine or for the granite-paved track required for horse traction. Another great advantage which cannot be secured elsewhere is that the tramway is laid on one side of the road, and from this raised tramway all ordinary traffic is excluded by a granite curbstone. The gauge is only 3 ft., and to twice that extent the company monopolizes the highway. The cost of construction under these circumstances has only been one-quarter of that incurred on tramways less favorably situated. The steel rails are laid level with a graveled surface, and parallel to them extends a third iron rail, which is used to conduct the current from the dynamo-machine to the cars, contact being effected by means of an electric brush. The whole of the electricity required is supplied from the central station at Portrush. When the turbines fail to yield the requisite power, steam will be employed to generate the electricity. The line will be used not merely as a tramway, but also as a railway for the conveyance of goods and minerals, electricity being in all cases the only motive power employed. According to the sanguine estimate of the promoters, whereas the cost of working the line by horses would be 11d. a mile and by steam 7d., they expect to effect it at a cost of 1d. If they do this their success is assured. But the chances are against them. No electric motor has as yet been able to earn a dividend, and it will be an agreeable surprise if the new railway to the Giant's Causeway should prove an exception to the rule.—Pall Mall Gazette.

This tramway extends from Portrush to the Giant's Causeway, a distance of 6 miles. Power to generate the electricity required is furnished by turbine wheels, the water being taken from the River Bush.

Promptness in Protecting a Train.

Regarding the collision on the Troy & Greenfield Railroad Feb. 1, which was investigated by the Massachusetts Railroad Commissioners, the Board has rendered the following decision:

"This was a rear collision near the west portal of the tunnel between a construction train of three cars, employed by the state management, and a freight train (No. 27) of 13 cars of the New Haven & Northampton Co. The collision occurred at 3:20 p. m. The New Haven & Northampton train was stopped at the portal by a danger signal, and remained stationary for nine minutes before the collision. The duty of the employees operating this train was to promptly flag the rear. This by all the evidence was not done. The brakeman, after setting up two brakes, which might occupy two minutes, had passed only three telegraph poles. If he had started promptly and moved as he ought, the construction train would have had ample time to stop. The slow movements of the brakeman were the cause of the accident. The conductor also was at fault in not attending to the flagging. He testifies that he neither did nor said anything about it, trusting entirely to the brakeman. The telegraph operator and the other employees of the state did their full duty. It need hardly be said that the tunnel and the state road, which alone of all the railroads in Massachusetts is used by the locomotives of different corporations, can be safely operated only by extreme care on the part of the operating companies, and this cannot be too carefully impressed upon their employees. The damage done in this case was small. The neglect of duty was clear, and might have led to serious consequences."

Fishing for a Locomotive.

About four months ago a New Orleans Pacific locomotive, weighing 36 tons, was dropped into the Atchafalaya River at the railroad crossing. Several parties in the South tried to get the engine out of the water, but failed. The St. Louis Underwriters' Wrecking Co. was applied to, and after considering the situation went to the rescue. A few days ago a telegram was received stating that the iron-horse was found in 60 ft. of water and was fished out and delivered to the railroad company on its tracks at the crossing.

Train Accident Report—Correction.

We are informed that two collisions given in our report of train accidents in December as occurring on the New York & New England road were not correctly described.

The butting collision given on Dec. 9 between a passenger and a freight train at Chewink, Conn., was between two freight trains, and the damage done was slight.

The collision reported as a butting collision near Mt. Bowdoin, Mass., Dec. 26, was a rear collision, damaging only the pilot and front end of one engine and the caboose of the other train.

We are also informed that there has been a disposition in some places on the line to magnify the importance of accidents and even to circulate reports of accidents which never occurred. The motive is evidently malicious.

It is impossible to verify each accident reported to us, but where mistakes do occur corrections will always be willingly made.

The Wood and Christie Brake Shoe Patents.

In the United States Circuit Court in Boston, Feb. 7, Judge Nelson gave an opinion in the patent suits of the National Car-Brake Shoe Co., of Pennsylvania vs. the Boston & Albany, Boston & Maine and Old Colony companies, dismissing the bills with costs. These three suits were for infringement of patent No. 45,106, granted to Joseph Wood, Nov. 15, 1864, for an improvement in car-brake shoes, and assigned to the plaintiff. The brake shoe in use by the defendants is the one covered by patent No. 49,948, granted to James Christie, Sept. 12, 1865. The parties agreed that the Wood patent was valid, and the question submitted was whether the first claim of the Wood patent was infringed by the Christie patent, both patents relating to the manner of attaching the sole, or the part which bears against the rim of the car wheel, to the shoe. The opinion finds that the Christie patent has many advantages over the Wood device, and that it is for a different combination of parts from the Wood patents, and that its use is not an infringement of the latter.

Jumping off the Train.

"Conductor" writes to us commending the article with this title published in the Railroad Gazette of Jan. 26, page 58, and says that it should be published at least twice a year. He, however, takes exception (and rightly so) to the following sentence: "Take the general run of people who jump off moving trains and when a man jumps he'll jump with the train. By so doing he adds his own momentum to that of the train. As a natural consequence he loses his balance and goes head over heels until the obstructions

he meets with counteracts the other force. The chances are that when this happens he's either badly bruised, or, more probably, badly injured, even if he keeps out of the way of the cars."

Concerning this, our correspondent says: "This should be corrected, as it is liable to lead people astray. Any practical railroad man knows that the proper way to get off a car in motion is to face the way the car is going, and when you land have your feet in motion, so as to keep your balance."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Alleghany Central, special meeting, at the office in New York, March 24, to vote on an agreement with the Lackawanna & Pittsburgh Co.

Cleveland, Columbus, Cincinnati & Indianapolis, annual meeting, at the office in Cleveland, O., March 7. Transfer books close Feb. 20.

Lehigh Coal & Navigation Co., annual meeting, in the Board of Trade rooms in Philadelphia, Feb. 27, at 11 a. m.

Union Pacific, annual meeting, at the office, No. 195 Broadway, New York, March 7, at 10 a. m. Transfer books close Feb. 19.

Wabash, St. Louis & Pacific, annual meeting, at the office in St. Louis, March 13.

West Jersey, annual meeting, at the office in Camden, N. J., March 6, at noon.

Technical Meetings and Conventions.

The *American Institute of Mining Engineers* will hold its annual meeting in Boston, beginning on Tuesday, Feb. 20.

The *Master Mechanics' Association* will hold its annual convention in Chicago, June 19 next.

Railroad Conventions.

The *General Baggage Agents' Association* will hold its annual convention at the Grand Central Hotel, New York, beginning on Wednesday, Feb. 21. Agents have been requested to compile for this meeting statements of unclaimed baggage and results of weighing baggage; also list of special checks issued to points to which there are in use regular or joint reversible baggage checks by route named on the special check.

The *National Association of General Passenger and Ticket Agents* will hold a special meeting at the National Railway Club Rooms, No. 46 Bond street, New York, beginning March 13, at 11 a. m. This meeting is called by request to take the place of the regular spring meeting, which was appointed for March 20, at Jacksonville, Fla.

The *General Time Convention* will hold its spring meeting at the Lindell House in St. Louis, April 11.

The *Southern Time Convention* will meet at the National Railway Club Rooms, No. 46 Bond street, New York, April 18.

Dividends.

Dividends have been declared as follows:

Chicago Burlington & Quincy, 2 per cent., quarterly, payable March 15.

Maine Central, 2½ per cent., payable Feb. 15. This is the second dividend.

New York, Ontario & Western, 12 per cent. on the preferred stock, payable March 1. Transfer books close Feb. 20. This is the first dividend; the preferred stock amounts to only \$2,000,000.

North Pennsylvania (leased to Philadelphia & Reading), 1½ per cent., quarterly, less 5 per cent. retained for contingent fund, payable Feb. 26.

ELECTIONS AND APPOINTMENTS.

Addison & Northern Pennsylvania.—Mr. Frank M. Baker has been appointed General Superintendent. He was recently on the Southern Central road.

Batesville & Brinkley.—At Little Rock, Ark., Jan. 22, the following officers were elected: Wm. Black, President; J. W. Martin, Secretary and Treasurer; D. C. Brown, Attorney.

Boston & Albany.—At the annual meeting in Boston, Feb. 14, the following directors were chosen: Henry Colt, Jarvis N. Dunham, Pittsfield, Mass.; Edward B. Gillett, Westfield, Mass.; James A. Rumrill, Springfield, Mass.; Edward L. Davis, Worcester, Mass.; Jacob C. Rogers, Feabody, Mass.; Moses Kimball, Charles S. Sargent, Brookline, Mass.; John Cummings, Woburn, Mass.; George O. Crocker, New Bedford, Mass.; Wm. Bliss, John C. Phillips, Mahlon D. Spaulding, Boston.

Boston, Hoosac Tunnel & Western.—Mr. Charles H. Cory is appointed Superintendent, with office at Mechanicsville, N. Y., in place of John L. Butman, resigned.

Buffalo, New York & Philadelphia.—This company as consolidated has elected directors as follows: Franklin S. Buell, E. P. Bents, Bronson C. Rumsey, F. F. Pratt, Buffalo, N. Y.; J. R. Trimble, Camden, N. J.; Clarence H. Clark, B. K. Jamison, J. W. Jones, E. A. Rollins, Philadelphia; Calvin H. Allen, Brice Grace, E. Lowen, Archer N. Martin, S. N. Seligman, E. F. Winslow, New York. The board has elected J. W. Jones, President; Calvin H. Allen, First Vice-President; Archer N. Martin, Second Vice-President; J. R. Trimble, Secretary; Franklin S. Buell, Treasurer.

Chicago, Milwaukee & St. Paul.—Mr. E. Fairbairn has been appointed Master Mechanic at Milwaukee in place of Henry Watkeys, who has gone to the New York, Chicago & St. Louis.

Cincinnati & Eastern.—Mr. S. Woodward has been appointed General Manager. He was formerly connected with the road, but has for some time past been one of the Receivers of the Marietta & Cincinnati road.

Cincinnati, Washington & Baltimore.—The directors of this company (successor to the Marietta & Cincinnati) have elected Oriand Smith, President; Charles F. Low, Secretary and Auditor; W. E. Jones, Treasurer. Col. Smith is Third Vice-President of the Baltimore & Ohio.

Illinois, Iowa & Nebraska.—The directors of this company are: John G. Fonda, John H. Duker, Fred. W. Menke, Quincy, Ill.; Wm. Hill, John H. Finlay, Warsaw, Ill.; Henry A. Osborne, Chicago; H. Ketchum, New London, Wis.; David M. Kelly, Green Bay, Wis.; William H. M. Sistrare, Walter Scranton, Samuel Marsh, New York.

International Construction Co., of Mexico.—The officers are: President, C. F. Huntington; Secretary and Treasurer, J. E. Gates; Agent in Mexico, John B. Frisbie; Chief Engineer, Robert B. Gorsuch; Chief of Construction, John B. Converse.

Kentucky Central.—The following officers were elected Feb. 2: President, M. E. Ingalls; Vice-President, John Echols; Secretary and Treasurer, Chas. H. Bronson; General Freight and Passenger Agent, C. L. Brown; General Counsel, John W. Stevenson; Superintendent, E. W. Bender.

Louisville, New Albany & Chicago.—At the annual meeting, Feb. 13, the following directors were chosen: J. Caldwell, R. R. Hill, H. Victor Newcomb, E. D. Standiford, R. S. Veech, Bennett H. Young, Louisville, Ky.; John J. Astor, J. A. Gargullo, E. H. Green, Robert Lenox Kennedy, Roswell G. Rolston, Samuel Sloan, Wm. Wheelwright, New York. The only new director is Mr. Young, who succeeds Henry Crawford, of Chicago.

Manitoba Southwestern.—At the annual meeting in Winnipeg, Man., Feb. 7, the following directors were chosen: H. Ashdown, Allan Manville, James J. Hill, Edward Sawyer, J. H. Hammond, W. V. Cluff, Hugh Sutherland, A. H. Bode, Charles C. Smith. The election is contested by some local stockholders.

Massillon & Cleveland.—At the annual meeting, Feb. 6, the following directors were chosen: P. G. Albright, G. W. Cass, L. H. Meyer, Simon Perkins, John Sherman, Amasa Stone. The road is leased to Pennsylvania Company.

Meherrin Valley.—Mr. W. B. Brown is Chief Engineer of this road, with office at Margarettsville, N. C.

New York Central & Hudson River.—Mr. H. S. Morse has been appointed Assistant Superintendent of the Western Division (DeWitt to Buffalo), with office in Rochester, N. Y.

New York, Chicago & St. Louis.—Mr. J. M. Richardson has been appointed Engineer, and N. McLaughlin General Foreman of Bridges of the Eastern Division.

New York Railroad Commission.—The New York Railroad Commission has been organized by the choice of Mr. John D. Kernan as President, and Thomas O'Neil as Secretary-at-Arms. No Secretary has yet been chosen, the Commission desiring to find a man for that office who is familiar with railroad accounts and business.

Old Dominion Steamship Co.—At the annual meeting in New York, Feb. 14, the following directors were elected: N. L. McCready, John M. Robinson, Isaac Bell, George F. Tyler, D. Huntington, John Bodine, C. P. Fischer, C. C. Stockley, Jacob Moore. The board re-elected N. L. McCready, President; John M. Robinson, Vice-President; Isaac Bell, Treasurer *pro tem.*, and W. H. Stanford, Secretary.

Oseola & Malden Short Line.—The directors of this new company are: N. J. Bowen, John Drive, W. B. Edgington, Oseola, Ark.; Caldwell Bradshaw, Little Rock, Arkansas.

Pennsylvania Railroad Leased Lines.—At the annual meetings in Philadelphia, Feb. 13, directors were chosen as below for the following companies, all controlled by the Pennsylvania Railroad Co.: **Lykens Valley.**—George B. Roberts, Isaac J. Wistar, John P. Green, A. J. Cassatt, Strickland Kneass, Wistar Morris, N. P. Shortridge, J. N. DuBarry, Edmund Smith. **Mineral Railroad & Mining Co.**—The same directors. **Susquehanna Coal Co.**—The same directors. **Summit Branch.**—George B. Roberts, A. J. Cassatt, Edmund Smith, Strickland Kneass, Wistar Morris, N. P. Shortridge, J. N. DuBarry, John P. Green, Jas. W. Johnson, Edwin P. Worster, Isaac J. Wistar. **Pennsylvania Canal.**—President, Isaac J. Wistar; Directors, Isaac J. Wistar, George B. Roberts, A. J. Cassatt, Strickland Kneass, Wistar Morris, William J. Howard, Edmund Smith, M. Hall Stanton, Alexander Biddle, S. M. Felton, Simon Gratz, John P. Green.

Philadelphia & Erie.—At the annual meeting in Philadelphia, Feb. 12, the following directors were chosen: J. N. DuBarry, Wm. L. Elkins, Wm. J. Howard, Strickland Kneass, Wistar Morris, Henry M. Phillips, N. Parker Shortridge, Samuel G. Thompson, Henry D. Welsh, J. Price Wetherill. The road is leased to the Pennsylvania Railroad Co.

Providence & Worcester.—The new board has re-elected George A. Leete, President; John R. Balch, Clerk and Treasurer; W. E. Chamberlain, Superintendent.

Schuylkill Navigation Co.—At the annual meeting in Philadelphia, Feb. 13, the following were chosen: President, Frederick Fraley; Managers, John N. Hutchinson, Charles W. Wharton, George Brooks, Charles Baber, Michael Ward, Thos. R. Patton; Treasurer and Secretary, Richard Wilkins.

Scioto Valley.—At the annual meeting in Columbus, Feb. 8, the following directors were chosen: George Davis, Portsmouth, O.; Marcus Boggs, Chillicothe, O.; Wm. W. Franklin, Joseph Robinson, George Skinner, Columbus, O.; Wm. Adams, Frank H. Davis, Horace Porter, Edward F. Winslow, New York. The only new director is Frank H. Davis, who succeeds H. K. McHarg.

Southern Central.—Mr. John Taylor has been appointed General Traffic Manager. He holds the same position on the Lehigh Valley road.

Mr. R. Asa Packer is appointed Managing Director, and will have general control of the road, which is thus brought directly under Lehigh Valley management.

Toledo, Cincinnati & St. Louis.—Mr. L. H. James has been appointed Superintendent of Motive Power, with office in Toledo, Ohio.

Union Railway, Transfer & Stock Yards Co.—At the annual meeting of this company (Indianapolis Belt) in Indianapolis last week, the following directors were chosen: M. A. Downing, W. P. Ijams, A. D. Lynch, R. S. McKee, John Thomas, Indianapolis, Ind.; John F. Miller, Richmond, Ind.; W. R. McKee, D. W. Minshall, Terre Haute, Ind.; Horace Scott, Louisville, Ky. The board elected W. R. McKee, President; Horace Scott, Vice-President; A. D. Lynch, Secretary and Treasurer.

United States Rolling Stock Co.—At the annual meeting in New York, Feb. 6, the following trustees were chosen: A. Hegewisch, Wm. H. Guion, Fred W. Foote, E. G. Fabbri, H. R. Baltzer. The following officers were elected: A. Hegewisch, President; D. M. Monjo, Secretary and Treasurer; Charles M. Dacosta, Counsel; David Comfoot, London Agent.

Utica, Ithaca & Elmira.—At the annual meeting in Elmira, N. Y., last week, the following were chosen directors: Conrad L. Jordan, W. A. Booth, New York; Myron A. Smith, Josiah Hazard, A. A. McLeod, Chauncy M. Beadle, J. Davis Baldwin, Elmira. At a subsequent meeting of the directors, A. A. McLeod was chosen President.

Vincennes, Jasper & Ohio River.—The directors are: R. M. Welman, Jasper, Ind.; O. B. Stein, Otwell, Ind.; H. A. Foulks, Eugene Hack, P. R. McCarthy, J. S. McCoy, G. F. Montgomery, Vincennes, Ind.; G. B. Kerper, Albert Netter, Gabriel Netter, L. B. Newburg, Nathan Newburg, Charles Rice, Cincinnati.

Wabash, Paducah & Southern.—The directors of this new company are: B. Barr, J. C. Willis, Metropolis, Ill.; F. A. Von Gassy, Effingham, Ill.; Wm. Lindsay, Martinsville, Ill.; James C. Allen, Olney, Ill.; Jay G. Rupert, Florida, Ill.; E. Pratt Buell, Warsaw, Ill.; J. K. Bondurant, Paducah, Ky.; J. H. Livingston, St. Louis.

West Jersey.—Mr. J. J. Burleigh has been appointed Train Master in place of S. O. Malin, who has gone to the Baltimore & Potomac road.

York Beach.—The officers of this new company are: President, Edward S. Marshall; Clerk and Treasurer, J. C. Stewart. Office in York, Maine.

PERSONAL.

—Major John L. Butman has resigned his position as Superintendent of the Boston, Hoosac Tunnel & Western road.

—Mr. A. B. Southard denies the report that he has resigned his position as General Freight Agent of the Louisville, New Albany & Chicago road.

—It is reported that Mr. John B. Carson, General Manager of the Hannibal & St. Joseph road, is to have an important position on the Wabash, St. Louis & Pacific road.

—Mr. Daniel S. Lathrop, for many years a member of the firm of Thatcher, Lathrop & Co., car-wheel manufacturers, died at his residence in Albany, N. Y., Feb. 13, aged 55 years. He was a brother-in-law of Leland Stanford, President of the Central Pacific.

—Mr. Edward Studley, Master Mechanic of the Northern (New Hampshire) Railroad, died at his residence in Concord, N. H., Feb. 11, aged 58 years. He was at one time connected with the Lake Shore & Michigan Southern road, and had also served as Master Mechanic of the Concord Railroad.

—Hon. Samuel L. Crocker, of Taunton, Mass., died at the Hotel Vendome, Boston, Feb. 10, aged 78 years. He was born in Taunton, graduated at Brown University and was for many years a manufacturer in his native town. He was President of the Taunton Locomotive Manufacturing Co., and for many years a director of the Old Colony Railroad Co., besides holding office as director or trustee of several banks and public institutions. Mr. Crocker had also served in the Massachusetts Council and represented the Taunton District in Congress.

—Col. John M. Fessenden died in Washington, Feb. 8, aged 80 years. He was born in Warren, R. I., and graduated from West Point in 1824, serving in the army until 1831, when he resigned and entered upon the profession of civil engineer. He was Chief Engineer of the Boston & Worcester Railroad during its construction, and also had charge of the surveys of the Western Railroad from Worcester to Springfield, the Boston & Maine and several other New England roads. In 1845 he was Railroad Commissioner of Massachusetts. He retired from active life some 20 years ago, and had since lived in Washington.

—Hon. Edwin D. Morgan died Feb. 14, at his residence in New York, aged 71 years. He was born in Berkshire County, Mass., but came to New York in 1836, and engaged in business there. For many years Mr. Morgan has been one of the most prominent merchants of New York, and was twice elected State Senator and twice Governor of the state, serving also six years as United States Senator. He was also twice offered the position of Secretary of the Treasury, but declined. Gov. Morgan had considerable interests in railroad property, but was never much concerned in railroad management; he, however, was for several years a director of the New York, Lake Erie & Western and the Western Union Telegraph Co.

—Mr. Wm. E. Dodge, an old and prominent merchant of New York, died suddenly in that city Feb. 9, aged 77 years. He was for many years a partner in the well-known importing firm of Phelps, Dodge & Co. (retaining his interest in the firm until his death) and accumulated a large fortune. He had large investments in timber lands in the West and South, which have been for the most part managed by his sons. He was also largely interested in railroad property; he was one of the first directors of the old New York & Erie Co., and served on the board for 12 years. He was for 30 years a director of the New Jersey Central, retiring in 1873, and served as director and President of the Houston & Texas Central. His longest connection was with the Delaware, Lackawanna & Western, of which he was a director from the first organization up to his death. Mr. Dodge was connected with many philanthropic institutions and societies, and took a prominent part in religious movements.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Month of January.	1883.	1882.	Inc. or Dec.	P. c.
Boston, Hoosac & W. R.	\$21,409	\$21,321	I.	810.38
Bur. Cedar Rap. & No.	197,402	252,923	D.	50,421 25.9
Central Iowa.	77,309	93,031	D.	15,722 16.9
Chesapeake & Ohio.	244, 42	298,746	L.	54,306 22.0
Ch. & Grand Trunk.	234,918	148,546	L.	86,372 57.9
Ch. & West Michigan.	86,695	116,138	D.	29,443 33.9
Cin. Ind. St. L. & Chi.	191,828	218,599	D.	26,771 13.9
Cleve. Akron & Columbus.	37,033	32,022	D.	5,011 13.7
Detroit, Lansing & No.	106,053	112,839	D.	6,786 6.3
Eastern.	245,252	224,050	I.	21,202 9.4
Elizabeth & N. J. & Big S.	47,381	28,710	L.	18,670 64.2
Evansville & Terre Haute.	55,071	56,246	D.	1,175 2.1
Flint & Pere Marquette.	16,254	16,036	L.	218 1.4
Grand Trunk.	1,564,958	1,380,185	L.	184,773 11.9
Green Bay, Winona & St. P.	28,836	25,531	D.	3,305 11.6
Ill. Central, Ill. lines.	531,292	588, 61	D.	56,969 9.7
Iowa lines.	119,943	125,493	D.	5,550 4.6
Lake Erie & Western.	131,096	126,708	L.	4,388 3.3
Little Rock & Ft. Smith.	55,311	37,613	L.	17,698 46.7
Little R. Miss. & Texas.	35,477	22,600	L.	12,877 56.6
Memphis & Charleston.	113,000	101,000	L.	12,000 11.9
Mill, Lake Shore & West.	63,281	61,293	L.	1,988 3.1
N. Y. & N. England.	258,206	213,841	L.	44,365 20.8
Norfolk & Western.	113,263	98,849	L.	14,414 12.6
Ohio Central.	75,582	80,854	D.	5,272 6.9
Oregon Ry. & Nav. Co.	3,840.0	333,889	D.	14,789 3.7
Net earnings.	180,600	187,975	I.	7,375 4.0
Peoria, Dec. & Evansville.	50,493	67,755	D.	17,262 34.4
St. Louis, Alton & T. H.	123,454	107,298	L.	16,156 13.2
Main Line.	70,169	66,950	L.	3,219 4.5
Belleville Line.	71,408	63, 82	L.	7,586 10.6
St. P. & Duluth.	480,733	29,481	D.	451,252 93.9
St. P. Minn. & Manitoba.	38,615	35,733	L.	2,882 7.5
Scioto Valley.	80,002	10,509	L.	69,493 86.2
Toledo, Cin. & St. L.	123,454	107,298	L.	16,156 13.2
First week in February:				
Chl. & Alton.	\$128,768	\$128,595	I.	\$173 0.1
Chl. & Eastern Illinois.	25,258	25,789	D.	531 2.0
Chl. Mil. & St. Paul.	214,000	252,000	D.	38,000 17.7
Columbus, H. Vy. & Tol.	44,058	43,635	L.	423 0.9
Denver & Rio Grande.	95,500	100,100	D.	4,600 4.8
Hannibal & St. Joseph.	43,250	51,100	D.	7,850 18.1
Ind. Bloom. & Western.	51,434	54,108	D.	2,674 5.2
Louisville & Nashville.	260,225	240,132	L.	20,093 7.7
Northern Pacific.	75,830	67,300	L.	8,530 11.1
St. L. & San Francisco.	53,000	65,200	D.	12,200 23.0
Year ending Dec. 31:				
Bur. Cedar Rap. & No.	\$2,800,070	\$2,319,036	I.	\$481,034 20.8
Net earnings.	934,677	6,187	L.	928,490 46.2
Cleve. Col. Cin. & Ind.	4,267,478	4,330,108	D.	62,630 1.5
Louisville & Nashville.	12,951,432	11,344,382	L.	1,607,050 12.4
Net earnings.	4,939,393	4,351,756	L.	587,637 13.5
Month of November:				
St. John & Maine.	\$14,485	\$14,084	L.	\$401 2.9
Net earnings.	8,609	3,271	L.	5,338 61.3
Month of December:				
Cleve. Col. Cin. & Ind.	\$346,978	\$318,713	L.	\$28,265 8.0
Oregon Improvement Co.	271,306	228,676	L.	42,630 15.5
Net earnings.	71,330	29,083	L.	42,247 59.3

Grain Movement.

For the week ending Feb. 3 receipts and shipments of grain of all kinds at the following Northwestern

markets and receipts at the seven Atlantic ports have been, in bushels, for the past seven years:

Year	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1877	1,477,302	970,548	1,975,549
1878	2,090,934	2,405,538	3,680,912
1879	2,863,061	1,681,013	3,626,153
1880	2,900,637	1,431,079	1,845,321
1881	3,050,080	1,432,348	2,140,442
1882	4,869,088	3,082,260	2,010,370
1883	5,414,875	3,229,918	3,000,976

The receipts at the Northwestern markets for the week were thus larger than in the corresponding week of any previous year—11 per cent. more than last year, when they were extraordinarily large, and 77½ per cent. more than in 1881. The receipts this year have never been equaled in a winter week, not even in January last year, when for four weeks they were larger than ever before in the winter. They grew smaller from week to week this year after December, and it is probable that the extraordinary receipts of the week to Feb. 3 were largely due to arrivals that had been delayed by snow on the way, there being an increase of 2,170,000 bushels (67 per cent.) over the receipts of the previous week. More than half the receipts were corn, and these were among the largest ever had at this season. The increase over the previous week was great at every important grain market, but greatest at Chicago, where it was more than 100 per cent.

The shipments of these markets were also larger than in the corresponding week of any previous year, but only 5 per cent. more than last year. They also were more than half corn. Of these shipments 196,892 bushels or 6.1 per cent. went down the Mississippi. The total shipments are the largest since navigation closed, and the rail shipments have very rarely been equaled at any season.

The Atlantic receipts for the week were much larger than in either of the three years next previous, but less than in 1878 and 1879, when rates were very low. They were a little larger than in the two weeks next previous, but only a trifle above the average in December and January. The increase was almost wholly at Baltimore, where they were larger than in any previous week since September.

The grain exports of the week were 2,357,277 bushels, more than half corn; 44.5 per cent. went from New York, 28.6 from Baltimore, 13.7 from Philadelphia, and 9 per cent. from New Orleans. Of the flour exports 72½ per cent. went from New York and 17 per cent. from Boston. For the week ending Feb. 7, exports of flour and grain were:

	1881.	1882.	1883.
Flour, bbls.	80,284	86,179	144,286
Grain, bu.	2,194,050	886,367	2,128,968

Including flour the exports this year were 110 per cent. more than last year and 8½ per cent. more than in 1881.

	Receipts.	Shipments.
1883.	109,844	169,051
1882.	1,396,777	2,197,925
1881.	815,809	1,832,750

The causes of the great decrease are two—snow and floods. Receipts at four Eastern ports for the week ending Feb. 10 have been:

	New York.	Boston.	Phila.	Baltimore.	Total.
1883.	1,026,683	314,650	271,950	674,837	2,288,150
1882.	1,004,211	488,685	254,650	191,270	2,028,616
1881.	664,700	228,700	318,100	644,430	1,855,948

P. c. of total:	1883.	1882.	1881.
1883.	44.9	13.8	11.9
1882.	54.0	24.1	12.5
1881.	35.9	12.3	17.1

Philadelphia and Baltimore together thus received 41.3 per cent. of the whole this year, against 21.9 last year, and 51.8 in 1881. At every place corn is the chief grain received. The flour receipts for the week this year were 222,273 bushels, of which New York received 63.6 per cent., Boston 25.2, Philadelphia 6.4, and Baltimore 4.8 per cent.

San Francisco exports for the six months of the California crop year from July 1 to Jan. 31, were as follows, flour in barrels and wheat in bushels, flour being reduced to wheat in the totals:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Flour	741,102	473,024	I.	268,078 56.7
Wheat	17,813,168	24,642,867	D.	6,829,699 27.7

Total bushels.... 21,518,678 27,007,987 D. 5,489,309 25.3

The increase in flour was chiefly to Great Britain and the Pacific islands; there was a decrease in exports to China.

Shipments of California barley by sea for the seven months were 168,833 centials, against 79,433 centials in the preceding year, an increase of 89,400 centials, or 112.5 per cent. Shipments of barley overland for the six months to Dec. 31, were 8,408 centials.

Suez Canal Traffic.

The number of vessels and their aggregate tonnage passing through this canal in each year since its opening, and the gross receipts therefore have been:

	Vessels.	Tonnage.	Receipts.
1870	486	435,911	5,159,377
1871	705	701,467	8,963,732
1872	1,082	1,439,100	16,407,591
1873	1,178	2,085,072	22,807,319
1874	1,204	2,423,672	24,859,383
1875	1,494	3,940,708	28,886,262
1876	1,457	3,372,107	29,074,098
1877	1,693	3,418,949	32,774,344
1878	1,563	3,151,535	34,068,229
1879	1,477	3,240,942	29,840,060
1880	2,026	4,344,539	39,840,487
1881	2,787	5,794,401	51,774,352
1882	3,198	6,811,521	60,504,878

The operations of the British expeditionary forces in Egypt last autumn realized for the company a sum of 2,000,000£. The traffic in the month of September, when Lord Wolseley occupied the canal, was 246 vessels, and the receipts were 6,120,000£, as compared with 199 vessels and receipts 3,814,810£, in September, 1881. The dividend of the company for 1881 was 13.7 per cent., including the 5 per cent. interest which each share carries. The increase in the revenue in 1882—namely, about 9 per cent.—will probably raise the dividend for that year to something over 20 per cent. for each share of the nominal value of 500£. Under the Stokes Convention the further reduction in the surtax to the extent of ½¢ per ton came into operation on Jan. 1. The effect of this will probably be to sensibly affect the company's receipts for the current year.

The Illinois Central's Omaha Traffic.

During the St. Paul railroad war the St. Paul & Omaha made an arrangement with the Illinois Central for making a freight line between Chicago and Omaha, and by making very low rates from Omaha to Chicago the St. Paul & Omaha was able to injure the traffic of the Milwaukee & St. Paul, its antagonist in this contest, while the Illinois Central purposed to make low rates from Chicago to Omaha until it could secure a restoration of rates to Sioux City and some other points in Northwestern Iowa, where it meets the competition of the Chicago & Northwestern and the Rock Island, working in connection with the Burlington, Cedar Rapids & Northern, and perhaps the Milwaukee & St. Paul also. The close of the contest found the St. Paul &

Omaha in the possession of the Chicago & Northwestern, and we believe that rates on the Omaha-Chicago shipments were then restored. Last Thursday the several roads concerned agreed to restore the rates at Sioux City, and the Illinois Central's grievances are now satisfied, it appears. It will now probably restore its Chicago-Omaha rates; but if it does so it is not likely to carry a considerable part of the traffic, the distance being 657 miles by its route, against 490 by the shortest lines.

Coal.

Anthracite coal tonnages for the month (five weeks) ending Feb. 3 are reported as follows, the tonnage in each case being only that originating on the line to which it is credited:

	1883.	1882.	Inc. or Dec.	P. c.
Phila. & Reading.....	460,518	488,135	D. 27,617	5.7
No. Cent. Shamokin.....	95,802	108,009	D. 12,207	11.3
Summit Branch R.R. (Sun., Hazleton & Wilkes-barre.....	3,746	523	I. 3,223	6.3
North & West Branch R.R.....	40,846		I. 40,846	
Central of N. J., Lehigh Div.....	323,404	329,359	D. 5,955	1.8
Lehigh Valley.....	434,835	445,295	D. 10,460	2.3
Pennsylvania & N. Y.....	15,038	15,167	D. 129	0.9
Dela., Lacka. & Western.....	350,670	342,977	I. 7,693	2.2
Del. & Hudson Canal Co.....	298,359	283,636	I. 5,723	2.0
Pennsylvania Coal Co.....	95,810	83,561	I. 12,249	14.6
State Line & Sullivan.....	5,535	3,818	I. 1,717	45.0

Total anthracite.....2,115,563 2,100,480 I. 15,083 0.7

The North & West Branch road was not opened last year. The anthracite market is reported quiet, with a pressure to sell and consequent low prices. It is understood that one of the companies is urging sales very strongly with apparently a total disregard of price, much to the disgust of the more conservative managers.

The total tonnage of anthracite for the corresponding period for eight years was as follows:

1883.....	2,115,563	1879.....	1,820,099
1882.....	2,100,480	1878.....	1,399,548
1881.....	1,819,921	1877.....	1,193,933
1880.....	1,981,541	1876.....	1,245,232

This year's tonnage is the largest ever reported, notwithstanding the two weeks of short time included.

Semi-bituminous tonnages reported for the month are as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Cumberland, all lines.....	152,618	151,083	D. 38,465	20.1
Huntingdon & Broad Top.....	21,895	21,417	I. 478	2.2
East Broad Top.....	6,511	10,070	D. 3,559	35.6
Tyrone & Clearfield.....	240,106	227,752	I. 12,354	5.4
Bellefonte & Snow Shoe.....	28,180	12,457	I. 15,723	126.2

Total semi-bituminous.....449,310 462,779 D. 13,469 2.9

The semi-bituminous trade at the seaboard is dull, and prices are nominal.

A great increase in shipments from the Clearfield region is expected when the projected new lines into the region are completed. They will hardly be opened in time to have much effect on the trade this year, and their shipments will probably go West more than to tide-water.

The tonnage of anthracite coal passing over the Belvidere Division, Pennsylvania Railroad, in January was:

	1883.	1882.	Inc. or Dec.	P. c.
S. Amboy for shipment.....	63,954	59,332	I. 4,622	7.6
Local points on N. J. lines.....	64,027	48,737	I. 15,290	31.4
Co.'s use on N. J. lines.....	12,470	8,879	I. 3,591	40.3

Total.....140,451 116,948 23,503 20.1

Of the total this year 106,605 tons were from the Lehigh Region and 33,846 tons from the Wyoming Region.

Actual tonnage of coal passing over the Pennsylvania & New York road for the two months of its fiscal year from Dec. 1 to Feb. 3 was:

	1883.	1882.	Decrease.	P. c.
Anthracite.....	159,253	184,979	25,726	13.9
Bituminous.....	68,241	76,181	7,940	10.4

Total.....227,494 261,160 33,666 12.9

The larger part of the anthracite is from the Lehigh Valley road and of the bituminous from the Barclay road. Actual tonnage passing over the Huntingdon & Broad Top road for the month was:

	1883.	1882.	Inc. or Dec.	P. c.
Broad Top coal.....	21,895	21,417	I. 478	2.2
Cumberland coal.....	32,611	37,105	D. 10,494	28.3

Total.....48,506 58,522 D. 10,016 17.1

The Broad Top coal is mined on the line; the Cumberland carried through for the Pennsylvania Railroad.

Bituminous coal tonnages reported for the month are as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Barclay R. R. & Coal Co.....	35,383	41,293	D. 5,850	14.2
Allegheny Region, Pa. R. R.....	67,199	44,665	I. 22,534	50.5
West Penna. R. R.....	49,282	32,779	I. 16,483	50.2
Southwest Penna. R. R.....	2,756	2,543	I. 213	0.8
Penn and Westmoreland.....	126,713	132,927	D. 6,214	4.7
Pittsburgh Region, Pa. R. R.....	49,063	67,116	D. 18,053	26.9

Total.....330,376 321,263 I. 9,113 2.8

The gains and losses in bituminous shipments very nearly equal each other. The largest decreases were in Barclay and the gas coals. The loss in the Pittsburgh Region was due to trouble with the miners.

Coke tonnages for the month are reported as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Bellefonte & Snow Shoe.....	1,099	3,042	D. 1,943	64.7
Allegheny Region, Pa. R. R.....	10,456	10,641	D. 185	1.7
West Penna. R. R.....	11,056	15,189	D. 4,124	27.4
Southwest Penna. R. R.....	195,855	177,759	I. 18,146	10.2
Penn and Westmoreland.....	28,544	28,469	I. 75	0.3
Connellsville R. R.....	96,829	54,797	I. 42,032	76.5

Total coke.....343,848 289,847 I. 54,001 18.6

These tonnages are all over the Pennsylvania Railroad and branches, no other company reporting coke tonnages.

The coal tonnage of the Pennsylvania Railroad for the month was as follows.

	Originating on the line	Received from other lines.	Total.
Anthracite.....	57,829	132,128	189,957
Semi-bituminous.....	208,286	46,063	314,349
Bituminous.....	304,861	625	304,486
Coke.....	247,069	96,749	343,848

Total.....879,075 275,565 1,153,640

Per cent. of increase.....13.4

A change in the form of reports make a detailed comparison impossible. It must be remembered that, as the statements are made by weeks, the total for 1882 includes one day's shipments more than for this year.

The seventy-fifth anniversary of the first discovery and use of anthracite coal was celebrated by a meeting of the Historical Society at Wilkesbarre, Pa., Feb. 10. The celebration closed by a social meeting in the room in which the first anthracite coal fire was made, the room being warmed by a fire in the same grate which was used experimentally for the then unknown and untried fuel.

Chicago coal receipts for the nine months from May 1 to Jan. 31 were as follows:

	Anthracite.....	Bituminous.....
By lake.....	1882-83. 1881-82. 829,385 565,161	1882-83. 1881-82. 274,908 284,431
By rail.....	353,452 383,593	1,989,157 1,649,140
Total.....	982,837 948,754	2,264,065 1,933,571
Per cent. by rail.....	36.0 40.4	12.1 14.7

The total increase in anthracite was 34,083 tons, or 3.6 per cent.; in bituminous, 330,494 tons, or 17.1 per cent. The total receipts of all kinds were 3,246,962 tons in 1882-83, against 2,882,325 tons in 1881-82, an increase of 364,577 tons, or 12.7 per cent. Coke is included in bituminous coal.

A statement issued from the office of the Cumberland & Pennsylvania Railroad gives the shipments of Cumberland coal for 41 years as follows:

Baltimore & Ohio R. R.....	26,622,100
Chesapeake & Ohio Canal.....	13,171,416
Pennsylvania R. R.....	1,645,336
Total.....	41,448,852

The heaviest shipments made in any one year were 2,674,101 tons in 1873. The largest tonnage carried by the Baltimore & Ohio Railroad was 1,780,710 tons in 1873, by the Chesapeake & Ohio Canal, 879,838 tons in 1875.

Cumberland coal shipments for the week ending Feb. 10 were 29,373 tons. The total shipments this year to Feb. 10 were 181,991 tons.

"N. P." and "U. P."

The Northern Pacific and Union Pacific roads have issued the following joint circular addressed to officers and agents of connecting lines, and to shippers of freight:

"Owing to numerous and expensive mistakes that have been made because of the resemblance of the initials 'N. P.' and 'U. P.' (for Northern Pacific and Union Pacific respectively), and to the liability of bill clerks to substitute one of these initials for the other, a special request is hereby made that on and after Feb. 1, 1883, no freight be received, destined to points in the territory of Montana, on or via the above-named roads, upon expense bills, bills of lading, or shipping orders, in which the initials 'U. P.' or 'N. P.' are used, but that when the route is designated it be required that the words 'Northern Pacific' or 'Union Pacific' be written in full."

Rates to Points North and West of St. Paul.

Commissioner Carman, of the Northwestern Traffic Association, has issued the following circular: "It being understood by the members of this Association that rates are being quoted by our Eastern and Southern connections from Chicago and common points to points on the Northern Pacific and St. Paul, Minneapolis & Manitoba and Canadian Pacific Railways on basis of rates named on tariffs issued by individual roads in this Association prior to its organization, viz., Oct. 2, 1882, we therefore give notice that the lines in this Association will not protect any rates heretofore published by any road in the Association from Chicago, Milwaukee, or common points, or from St. Paul, Minnesota Transfer, or Minneapolis to points on the Northern Pacific, St. Paul, Minneapolis & Manitoba, or Canadian Pacific railways. Until some arrangement can be made with those railways for guaranteed rates between St. Paul, Minnesota Transfer and Minneapolis and their points, the lines in this Association can only quote rates between Chicago, Milwaukee and common points, and St. Paul, Minnesota Transfer, or Minneapolis."

Forwarding Freight Consigned to or from a Connecting Road.

The Iowa Railroad Commission Dec. 9 rendered a decision which is reported as follows:

L. H. Dalhoff & Co., of Burlington, were the complainants, and the Chicago, Burlington & Quincy Railroad Company and the Wabash, St. Louis & Pacific Railway the respondents. L. H. Dalhoff & Co. are merchants, located at Burlington. They complain that goods shipped by them Oct. 15, 1882, from Burlington to Solomon, a point on the Omaha Branch of the Wabash, St. Louis & Pacific Railway, in Mills County, were not delivered at Solomon until about Nov. 20. Mr. T. J. Potter, General Manager of the Chicago, Burlington & Quincy Railroad, says in reply to a copy of the complaint that the Chicago, Burlington & Quincy has handled none of the freight referred to. The goods, it appears from the evidence received, were shipped by the Chicago, Burlington & Kansas City Railway from Burlington to Sedan, a junction of the Chicago, Burlington & Kansas City Railway, for the Wabash, St. Louis & Pacific Railway, from whence they were forwarded to Humeston and there held until Nov. 20.

Mr. A. C. Bird, General Freight Agent of the Wabash, St. Louis & Pacific Railway, admits the delay of the goods at Humeston, and says the delay was caused by the route selected by the shippers. Complainant says in answer to this that if the Wabash, St. Louis & Pacific could not take the goods to the destination they should not have accepted them. The goods could have been shipped to Malvern or Shenandoah, within 15 miles of the destination, where the Wabash, St. Louis & Pacific crosses the Chicago, Burlington & Quincy, but the Chicago, Burlington & Quincy Railroad Company refuse goods for that section because the Wabash will not receive goods from the Chicago, Burlington & Quincy shipped from Burlington, except at certain designated points, for the reason that the Chicago, Burlington & Quincy would get pay for the long haul and the Wabash pay for the short haul, and that the route by the Wabash is the longer route.

The Wabash denies refusing to receive goods from the Burlington except at designated points. Messrs. Dalhoff & Co. say they are losing their trade in the localities mentioned in consequence of the want of harmony among the railroads through whom they should promptly reach their customers, and ask guarantees for the future, which is the only object aimed at by the complainant. It is not considered necessary to enter into a minute investigation to determine which company has been at fault.

The board is of the opinion that the shipper has the right to select the route that may be desired. It is the duty of the railroad officers to receive the freight over their respective lines, and bill it as the shipper desires. The long haul may be desirable to the carrier, but the convenience of the shipper should have primary consideration. The observance of this principle will give quite as much equality in the distribution of freights as arbitrary dictation by the carrier. No one else can determine for the shipper as well and so satisfactory to himself how he wants to reach his market, and any other policy will be productive of dissatisfaction. Messrs. Dalhoff & Co. have the right to ship by the Chicago, Burlington & Quincy to Malvern or Shenandoah, and it is the duty of the Wabash, St. Louis & Pacific Railway Company to receive goods at these points and carry them to Solomon, Imogene, and other points on their line at their customary local rates, where no point rate is arranged for, just as it is the duty of the Chicago, Burlington & Quincy Railroad Company to haul goods short distances over their line which traversed longer distances over the Wabash. Any other conclusion would cripple

trade without giving any benefit to the carrier. Freight naturally seeks the nearest or quickest, or cheapest route to market, and the fewer obstacles it meets with the better for the public. Freight, if allowed to enjoy this freedom, will distribute itself more satisfactorily over the railroads than if arrested and diverted by the carriers.

RAILROAD LAW.

Discrimination in Pennsylvania.

Four anti-discrimination bills are pending before the Pennsylvania Legislature. The most important is one which was introduced into the Senate by Mr. Gordon, and referred to the Judiciary Committee. It contains 13 sections and makes it a misdemeanor punishable with heavy fines and imprisonment for any railroad director or official to deny equal rights to any person or to make any discrimination whatever in tolls, freights or facilities. It declares both minor officials who obey and superiors who give orders to be punishable. It makes null and void all contracts by which corporations acquire rival lines, and punishes the offending directors. It prohibits common carriers from mining or manufacturing articles for transportation or purchasing any property except for transportation purposes, and declares all contracts in violation to be null and void. It punishes directors who allow employees to be interested in any furnishing of supplies, and makes it a misdemeanor to give or receive free passes except in the case of employees. If any public official accepts one, the mere acceptance shall be deemed a bribe. It shall be an offence to compromise any violation of the act. Informers are to be allowed one hundred dollars for their personal expenses, and plaintiffs shall receive full compensation for injuries. If any board of directors violate the law the charter shall be forfeited. Combinations to regulate the prices of coal or other articles shall be punished. A Board of Revision shall be named by the Legislature, which shall fix all rates and classify all goods, and shall meet every six months. The same class of goods shall be charged always at the same rate per mile, whether for long or short distances. When lines extend beyond the state, it shall be a misdemeanor for them to charge more for carrying outside of the state than within, and local rates shall be proportionately reduced whenever through rates are reduced. The Board of Revision shall have inquisitorial powers.

Right of Stockholders to Vote on Leases and Consolidation.

In his opinion in the suit of the Metropolitan Elevated Co. to set aside the so-called merger contract with the Manhattan Co., Judge Barrett, of the New York Supreme Court, says:

"The agreement in question was made by the directors of the respective railroads without consulting stockholders. There can be no doubt that the law of this state, as settled, vests in the board of directors the exclusive power to manage the concerns of the corporation; that is, all its lawful business under the charter. But I know of no authority for the proposition that the directors may make organic or fundamental changes looking to the practical obliteration of the corporation as a distinct and independent legal entity. It is one thing to say that the stockholders can do no corporate act, can make no valid contract for the corporation, cannot even compel the board of directors to do an act contrary to its own judgment. But it is quite another matter to say that they shall have no voice with regard to organic and fundamental changes. I am satisfied that it was never the Legislature's intention to permit so far-reaching a measure to be set in motion without the usual stockholders' consultation. If so wide a departure from first principles had been contemplated, the language conferring this extraordinary power upon the directors could not have been too specific and unmistakable. For the grant of such a power is not only contrary to the policy of the law, but contrary also to the legislative policy as expressed in numerous other enactments. * * * The effect of various incidents which might be pointed out—that is, whether or not they would be likely to affect the dissentients injuriously—is not to be considered for a moment. It is not for the Court to decide such questions, nor to assume, in the absence of specific words, that the Legislature meant to decide them for stockholders, who may prefer to decide them for themselves. * * * It would be grossly unjust to set the machinery in motion whereby such a change through such processes is to be effected without consulting the corporations, that is, the corporations, and it cannot be that the Legislature meant to work such injustice by conferring the exclusive power contended for upon the boards of directors and by depriving the stockholders of all preliminary expression of opinion. * * *

OLD AND NEW ROADS.

Alabama, New Orleans, Texas & Pacific Junction.—At a recent meeting of the shareholders in London, statements were submitted which embraced the following points: The company was formed to acquire interests in and to undertake the completion of three railroads, the Vicksburg & Meridian (142 miles), running from Meridian, the southern terminus of the Alabama Great Southern, to Vicksburg; the Vicksburg, Shreveport & Pacific (189 miles), running from Delta, opposite Vicksburg, to Shreveport, in Texas, and thence to the Texas state line, where it joins the Texas Pacific road; and the New Orleans & Northeastern (about 200 miles), commencing at Meridian and going direct to New Orleans. The Vicksburg & Meridian and the New Orleans & Northeastern are connected with the Alabama Great Southern at Meridian, and form, practically, extensions of that line, the New Orleans & Northeastern running south and the Vicksburg & Meridian due west. The 20 miles from Shreveport to the Texas state line, in pursuance of an old agreement, are now worked by the Texas & Pacific. This portion of the road will revert to this company on Jan. 1, 1884. This company also controls the lease of the Cincinnati Southern road, "and thereby secure a most valuable northern outlet for the traffic of their system." Thus the Southern system, with the aid of that important link in the chain, the Alabama Great Southern, has been placed in practical connection with the various western, northern and eastern roads which converge at Cincinnati. At New Orleans a local and suburban line, called the Spanish Fort Railroad, has been purchased. To provide adequate terminal accommodations in New Orleans extensive premises, known as the Compress property, have been purchased, the directors being advised that no better depot could be found in the city.

Baltimore & Ohio.—This company has finished the work of rebuilding and changing to standard gauge the recently purchased Pittsburgh Southern road from Washington, Pa., as far as Finleyville, and the work is being pushed toward Pittsburgh.

Work will be begun, as soon as the weather will permit, on the completion of the short line from Washington, Pa., to the Pittsburgh Division.

Boston & Albany.—At the annual meeting in Boston, Feb. 14, the stockholders voted again to ratify the issue of bonds made to pay for the state stock, this being made necessary by the technical informality in the previous action. It was also voted that Moses Kimball, John Cummings and Charles S. Sargent be appointed to approve and ratify all bonds and all notes payable at periods of more than twelve months from the date thereof, which may hereafter be issued by the road, and that the approval and certificate of either of them shall be sufficient. A motion to stop the running of trains over the road on Sunday was laid on the table.

Boston Elevated.—A strong effort is being made to carry through the Massachusetts Legislature the charter for an elevated railroad in Boston, which failed to pass last year. Arguments for and against the road are now being heard in committee. The line proposed is of the Meigs single-rail pattern, and is to run through some of the principal streets of the city.

Boston & Lowell and Concord.—It has been understood for some time that the agreement for the joint operation of the Boston & Lowell and the Concord roads was not working smoothly, and on Feb. 13 the following notice was issued by the Presidents of the two companies:

"The business arrangement heretofore existing between the Boston & Lowell Railroad Corporation and the Concord Railroad Corporation for the operation and management of the several railroads owned and leased by them has been terminated by mutual agreement, said termination to take effect at the close of business on the 28th instant."

It does not appear that there has been any quarrel or serious difference between the two companies. The agreement, however, owing to the decision of the New Hampshire Supreme Court against the contract first made, was necessarily somewhat loose and indefinite in terms, and experience proved that it was not possible to work conveniently under it. There is some talk of a new arrangement, but a better one is hardly possible without some legislative action, and that will be difficult, if not impossible, to secure, for the reason that there is in New Hampshire a very strong feeling against railroad consolidation, and, apparently, a fear of the absorption of the local companies by the stronger Boston lines.

Meantime it is understood that the relations of the Lowell and the Concord roads will be friendly, and that they will continue to exchange business and work in close connection with each other, divisions of through rates being made as before the agreement for joint operation was made.

Buffalo, New York & Philadelphia.—The formation of this new company by the consolidation of the Buffalo, New York & Philadelphia, the Buffalo, Pittsburgh & Western, the Oil City & Chicago and the Olean & Salamanca companies has been completed, the necessary certificates filed and the organization completed.

The lines of the consolidated company will be divided, for operating purposes, as follows: River Division, New Castle, Pa., to Olean, N. Y.; Pittsburgh Division, Oil City, Pa., to Buffalo, N. Y., with the Union and Fair Point branches; Buffalo Division, Buffalo to Emporium, Pa., with the Clermont Branch; Rochester Division, Olean, N. Y., to Rochester, with branch to Swains; Narrow-Gauge Division, Olean, N. Y., to Kinzua, Pa., and Eldred, Pa., to Bradford.

Buffalo, Pittsburgh & Western.—At the adjourned meeting last week the stockholders voted to ratify the consolidation with the Buffalo, New York & Philadelphia, the Olean & Salamanca and the Oil City & Chicago, under the name of Buffalo, New York & Philadelphia. Under the agreement of merger, the capital stock of the new company will be equal to the total capital of the several companies, and the new company will assume all the liabilities of the several companies merged. The holders of the common and preferred stock of the Buffalo, New York & Philadelphia Railroad Co. and the Olean & Salamanca Railroad Co. will receive 20 per cent. additional stock in kind, payable out of the stock now in the treasury of the Buffalo, Pittsburgh & Western Railroad Co. The stockholders of the Buffalo, Pittsburgh & Western Railroad Co. and of the Oil City & Chicago Railroad Co. (other than the Buffalo, Pittsburgh & Western Co.) will receive share for share. The Buffalo, Pittsburgh & Western Railroad Co. will receive share for share for all the stock of the Oil City & Chicago Co. remaining in its treasury after deducting the 20 per cent. to be paid to the stockholders of the Buffalo, New York & Philadelphia and the Olean & Salamanca.

Central Pacific.—A suit has been begun on behalf of the state of California to recover from this company certain interest paid by the state. The suit is based on the alleged violation of an agreement made in consideration of the state aid given to the railroad company. By an act of the Legislature, dated April 4, 1864, the state agreed to assist in the building of a line from Sacramento to the eastern boundary of California, by paying interest on an issue of bonds to be made by the company not exceeding \$12,000,000, bearing interest at 7 per cent., in semi-annual payments, and payable within 20 years after January, 1865. The grant was made to the company on condition that all official business should be done for the state free of charge. The company accepted all the conditions, but has, it is charged, refused to transport convicts and lunatics over the road free of charge.

Central Vermont.—The Boston Advertiser of Feb. 13 says: "The progress of the negotiations for a rehabilitation of the Central Vermont, though slow, is apparently sure, and unless some unforeseen obstacle should present itself, it is believed the plan will be carried to success within a short time. As has been stated, the scheme required the assent of a majority in interest of the holders of the trust and debt and of the Vermont & Canada stock before Jan. 1, which time was subsequently extended to Feb. 1. On that date the assents of about four-fifths of the trust debt and 17,877 of the 30,000 shares of Vermont & Canada stock had been secured, and 4,433 more of the latter have been since received. Of the 17,877 shares mentioned, certificates representing 7,584 shares have been deposited with the American Loan & Trust Co., the trustee under the plan of reorganization, and agreements representing the remaining 10,293 shares have been similarly deposited, of which the following is the form:

"The undersigned, as holder of — shares of the capital stock of the Vermont & Canada Railroad Co., hereby assents to the plan of reorganization adopted and put forth by the directors of the Central Vermont Railroad Co. at their meeting held Nov. 22, 1882, and will deliver up, transfer and assign his said shares pursuant to said plan, in exchange for the new 5 per cent. mortgage bonds therein described, whenever by doing so he can receive his quota of said new mortgage bonds in exchange for his said shares under said plan."

"These agreements were accompanied by proxies creating William G. Shaw of Burlington, Vt., attorney, with power to vote the stock in pursuance of the plan, and were

distributed to the stockholders in pursuance of resolutions adopted by the directors of the Vermont & Canada, Nov. 27, 1882, with a recommendation that the offer of the Central Vermont be accepted. The mortgage under which the reorganization is to be carried out is to be drawn to the satisfaction of B. F. Fifield, counsel for the Central Vermont, and William G. Shaw, counsel for the Vermont & Canada, and those gentlemen are presumed to be engaged in preparing the document."

Chicago & Western Indiana.—It is stated that this company will execute a consolidated mortgage for \$10,500,000, a sufficient amount to be reserved to provide for all existing debts, and the balance issued as required for improvements of the road, branches and additional terminal property in Chicago.

Cincinnati & Eastern.—At a special meeting in Cincinnati last week the stockholders voted to increase the capital stock from \$2,000,000 to \$3,000,000, in order to provide means for the proposed extension from Portsmouth, O., to Gallipolis.

Connotton Valley.—This company will, it is stated, shortly issue a circular to holders of its securities asking for subscriptions to the amount of \$800,000 or \$700,000, for the purpose of extending the Straitsville Division from Coshocton, O., to Zanesville, and to complete the terminal facilities in Cleveland and provide additional equipment.

Georgia Pacific.—The following official statement is issued under date of Jan. 31:

"From Atlanta to Anniston is 103 miles. Of this there have been laid 100 miles, leaving a gap of 3 miles, the grading of which is done, and the steel rails for which have gone forward. The road is being operated from Atlanta to a point near Edwardsville, say 70 miles, and it is expected that trains will run through to Anniston within a month."

"From Anniston to the Coosa River is 23 miles, of which 20 miles are graded and the balance will soon be done. The steel rail for this 23 miles has been bought for March delivery. Progress is being made on the masonry of the Coosa River bridge."

"From the Coosa River to Birmingham is 41 miles, of which 11 miles have been graded, and upon the balance of which large forces of laborers are engaged. It is expected that trains will run through from Atlanta to Birmingham by Nov. 1, 1883."

"From Birmingham to Columbus is 125 miles. No work has yet been entered upon from Birmingham west; but from Columbus east 43½ miles have been laid, and 8½ miles have been graded; 13 miles additional are under contract, to be completed in April, on which the grading is well advanced, large forces of laborers being engaged. The steel rail for this 21½ miles has been bought, and has gone forward in part."

"From Columbus to Johnsonville, on the Sunflower River, surveys have been made, but no work has been done."

"Between Columbus and Aberdeen and Bexar Lake and Aberdeen, surveys have been made and some little grading has been done—this work, however, being now suspended."

"From Aberdeen west to Grenada surveys have been made, but no work has been done."

"There is a narrow-gauge road (formerly the Greenville, Columbus & Birmingham Railroad), of 52 miles—say 29½ miles from Johnsonville to Greenville, and a branch of 22½ miles from Stoneville to Sharkey; 10½ miles of this branch (from Arcola to Sharkey) were built by this company since its purchase of the bonds and stock of the Greenville, Columbus & Birmingham Railroad Co. The old mortgage bonds on this road have been taken up and cancelled by the Richmond & Danville Extension Co., and the property is covered by the Georgia Pacific mortgage."

"There is also a connecting road between the Atlanta and Charlotte Air Line and the Georgia Pacific, of say 4 miles, running around Atlanta, thus securing to the Georgia Pacific a most valuable connection, about 6 miles shorter than the existing one in and through the city. On this connecting road 1½ miles have been laid with steel rail, and the remaining 2½ miles are graded and will be laid early in February, the rail being at hand."

"The road has been carefully located and is being well built, within the limits of reasonable cost. Neat and commodious depots, etc., have been and are being put up, and there are evidences of improvement all along the line."

"That portion of the road in operation between Atlanta and Anniston is provided with a sufficient equipment for present business, and the full equipment of \$2,000 per mile for this 103 miles has been bought and is going forward. The business thus far developed is quite as good as was expected, and the prospects for the future are encouraging."

"The Greenville road, 52 miles, as above, is equipped and in successful operation, giving promise of paying interest on \$8,500 per mile for the year beginning Oct. 1, 1882, or say, for the 52 miles, \$26,520 net per annum."

"The total length of the line from Atlanta, Ga., to Greenville, Miss., is thus 348 miles, of which 197 miles are laid with track, 45 miles graded and 46 under contract, leaving 60 miles on which work has not yet been begun. The amount expended on the road to Jan. 31 has been \$3,985,000; amount required to complete it estimated at \$3,050,000. The total authorized issue of 6 per cent. first-mortgage bonds is \$3,480,000, being \$10,000 per mile."

Hannibal & St. Joseph.—It is stated that negotiations are now in progress for the lease of this road to the Chicago, Burlington & Quincy and the Wabash, St. Louis & Pacific jointly. The details of the lease have not yet been arranged, and the terms have not been made public, but it is said that the lessees will jointly guarantee dividends on the preferred stock, and probably a small dividend on the common stock.

Hartford & Connecticut Valley.—This company last year proposed to issue new 6 per cent., 25-year bonds to build the extension of the road to Holyoke. Subscriptions were received for these bonds, and 40 per cent. was paid in. When the controlling interest in the road was sold to the New York, New Haven & Hartford Co., the extension was abandoned, and it was announced that these subscriptions would be bought in at 105. A few of the subscribers, however, have refused to accept these terms, and now demand that the bonds be issued to them on payment of the balance of their subscriptions. The company refuses to do this, however, and an interesting legal question may be raised.

Illinois Central.—This company makes the following statement of earnings for the month of January:

	1882.	1882.	Inc. or Dec.	P. c.
In Illinois	\$531,202	\$588,261	D.	\$56,999 9.7
In Iowa	119,948	158,483	D.	38,535 24.4
Southern Div.	407,410	272,700	I.	134,701 40.3
Total	\$1,058,620	\$1,019,453	I.	\$39,167 3.8

The Southern Division (Chicago, St. Louis & New Orleans road) appears now in the statements for the first time.

The Land Department reports sales of 3,886.26 acres of land for \$17,547.82 in January, 1883. The cash collections were \$16,940.04 for the month.

Illinois, Iowa & Nebraska.—This company has been organized to build a railroad from Poria, Ill., to Sioux City, Ia., by the most direct practicable line.

Illinois Midland.—The report of the special master on the administration of the former receivers of this road has been prepared and was presented to the United States Circuit Court this week.

It is reported that negotiations are in progress for a sale of the bondholders' interest in the road, but the name of the purchaser has not been made public.

International of Florida.—This company asks a charter for a railroad from the Georgia line through the whole length of the state of Florida to Key West, the line to pass through Tampa or reach that place by a branch. Among the incorporators are Gen. John B. Gordon, of Georgia; Wm. D. Watson and Nathaniel Green, of England; Dr. Edward Warren, of France; Hugh J. Jewett, of New York, and Maj. Robert W. Hunter, of Virginia. The length of the contemplated road is estimated at 400 miles, and the bill provides that the state of Florida shall grant the company 15,000 acres of land for each mile of road completed, in return for the "large amount of traffic and trade through the entire length of the State to and from the West Indies, Mexico and Central and South America," which it is claimed the construction of the road would secure. Under the bill the company is also granted the privilege of holding, owning and hiring such vessels, propelled either by sails or steam, as may be requisite to connect with the proposed railroad for the purpose of conveying mails, freight or passengers.

Kansas Southern & Texas.—This company has been incorporated to build a railroad from McPherson, Kan., southward across the Indian Territory to the Texas line.

Little Falls, Dolgeville & Piseco Lake.—The map of this road as located has been duly filed. The line is from Little Falls, N. Y., on the New York Central road, to Dolgeville, and thence to Piseco Lake in Hamilton County. The length of the road is 36 miles, and the line rises 409 ft. from Little Falls to the summit at Maunheim, and then falls 37 ft. to the terminus at Piseco Lake.

Louisville, New Albany & Chicago.—At the annual meeting, Feb. 13, the stockholders voted to approve and ratify the issue of \$1,000,000 collateral trust bonds, as proposed by the directors.

Manhattan.—In the New York Supreme Court this week Judge Barrett gave a decision denying the application for an order to restrain the Metropolitan Elevated Co. from continuing its suit to set aside the so-called merger agreement. He held that the action is a proper one, and that there is no reason why it should be enjoined.

The same judge also gave a decision granting the motion of the Metropolitan Co. to continue the injunction against the carrying out of the merger agreement of Nov. 14, 1881. The opinion holds that the agreement is void, not having been authorized or approved by the stockholders, and further that grave doubt would be cast upon its validity in any case by the composition of the boards of directors of the companies making the agreement.

These decisions give an important advantage to the Metropolitan stockholders who have opposed the merger agreement with the Manhattan.

Meherrin Valley.—This road is now completed from its junction with the Seaboard & Roanoke at Margarettsville, N. C., northwest to Warrens, Va., 4 miles. Work is being pushed towards Hicksford on the Petersburg road, 16 miles from Margarettsville. Considerable shipments of cotton and lumber already pass over the road, and it is expected to be a valuable feeder to the Seaboard & Roanoke. The company purposes extending the road from Hicksford west to Danville, through a section of country now without railroad facilities.

Memphis & Charleston.—No conclusion has been reached as to the termination of the lease of this road to the East Tennessee, Virginia & Georgia. The latest report is that the Memphis & Charleston Co. will not pay the money demanded by the lessee, but will bring suit to have the lease set aside.

Mexican Railroad Notes.—The following notes are from the Mexican Financier of Jan. 27:

The division of the Mexican National Railroad from Toluca to Maravatio will be opened to public travel, Feb. 1. General Manager John Scullin, Wm. Cross Buchanan, Consulting Engineer and G. W. Vaughn, Engineer-in-Chief, have published letters in the official paper guaranteeing the safety of the road. This action was necessary on account of the adverse decision of Government Inspector Ibarrola, who refused to recommend the formal opening of the road. The Department of Public Works has given the necessary authorization under the condition that, until the road-bed is further strengthened, the speed of trains shall not exceed 15 miles an hour.

The International Construction Co., in compliance with the terms of its concession, has published in the *Diario Oficial* a list of the officers and directors of the road, with a brief statement of work done to date. The formal surveys for the road were commenced at the Rio Grande in November, 1881, and construction begun Nov. 27, 1882. The company has issued no obligations. Reports from the Rio Grande state the progress of construction at the rate of a mile a day. (This is the Huntington or Southern Pacific line from El Paso.)

Mississippi, Albuquerque & Interoceanic.—The House Committee on Indian Affairs has reported adversely on this company's petition to Congress for leave to build a railroad through the Indian Territory. The report says that the Committee failed to find any evidence that the company has ever built any railroad, or that it has any money to build one.

Mississippi Valley.—A New Orleans dispatch reports that the grading of this road is now substantially completed along the bank of the Mississippi from New Orleans westward to College Point, La., a distance of 56 miles. Track-laying is in progress between New Orleans and Red Church.

Mutual Union Telegraph.—An agreement has been concluded for the lease of this company's lines to the Western Union Telegraph Co. for 999 years, the rental to be the interest (6 per cent.) on \$5,000,000 bonds, 1½ per cent. dividends on the \$10,000,000 stock and a yearly payment of \$50,000 to the sinking fund. The agreement also includes the dismissal of all the suits now pending between the two companies. It is understood that there will be a general consolidation of offices, and that the Mutual Union lines will be connected with those of the Western Union wherever possible.

Natchez, Red River & Texas.—This company has now completed its road to Cross Bayou, La., 3½ miles beyond the late terminus and 14½ miles from the eastern terminus at Vidalia. Work is now in progress on a long pile bridge over Cross Bayou.

Nevada & Oregon.—Mr. D. W. Balch, who claims to be President of this company, has just filed an extraordinary document with the Secretary of State of Nevada as

the report required by law. In it Mr. Balch says: "Of the amount and nature of the indebtedness of the company it is impossible to speak with any accuracy, in consequence of the books, vouchers and accounts being stolen, lost and mislaid by the former officers of the company, beyond the bonded debt of the company. Amount of mortgage, \$3,000,000; bonds negotiated, \$310,000; bonds in treasury, \$290,000; floating debt, including all claims and demands against the company of whatever nature, \$250,000.

"No dividend has ever been declared by this accused corporation, and it is safe to bet that none ever will be. The company owns no cars or engines; those on the road are owned by private parties.

"The net profits of this road have been nothing, as the corporation was conceived in iniquity and born in fraud. Every honest friend of the enterprise has been swindled and robbed, and disaster has overtaken all persons who have been connected with it in any capacity."

New York Central & Hudson River.—Articles of incorporation have been filed by the East Buffalo Terminal Co., covering a short branch of this road in the city of Buffalo.

This road has had considerable trouble from snow during the past week. The passenger tracks of the main line have been kept pretty clear, but there has been much delay in the movement of freight. On some of the branch lines all business was stopped for several days. East of Syracuse there has not been much delay.

New York City & Northern.—The New York Evening Post says: "We have received the following respecting the foreclosure of the first mortgage of the New York City & Northern Railroad Co. from parties conversant with the details. In September last the holders of a majority in amount of the four million mortgage of the New York City & Northern Railroad Co., of which the Central Trust Co. of this city is trustee, by appropriate action instructed the Trust Co. to institute a suit against the railroad company and others for the foreclosure of the mortgage, because of the default in payment of the interest which accrued on May last. The Railroad Co. and other defendants demurred to the complaint on the ground that, by the terms of the mortgage, a continuous default of one year must elapse before the bondholders could enforce any right of foreclosure for the non-payment of interest. This demurrer was argued before Judge Larremore at the Special Term of the Supreme Court in January, and his decision has lately been filed overruling the demurrer, but with leave to the company to answer upon terms. This decision assures to the bondholders their right to foreclose this mortgage for the non-payment of any coupon as it shall mature, and under the statutes of this state, as they now exist, upon such foreclosure, if the mortgage property is so situated that it cannot be advantageously sold in parcels, the entire property covered by the mortgage may be put up and sold; and this, although the principal sum secured by the mortgage has not become due."

New York & New England.—This company has put up electric signals at the bridge over the Connecticut River at Hartford.

During the month of January there were transferred across the Hudson River at Newburg eastward 3,025 loaded cars and 28 empty cars; of the loaded cars 1,674 carried coal. The transfer westward carried 424 loaded and 3,006 empty cars, making the total number of cars ferried across the river 6,483, an average of 209 cars a day.

New York, New Haven & Hartford.—This company has lately put up at the Norwalk draw-bridge signals similar to those in use on the Boston & Albany and other roads. These signals are described as follows: "At each end of the draw is an interlocking machine with five levers, protected from the weather and from unauthorized use by a small cabin. Lever No. 1 works a semaphore signal about 1,900 ft. from the draw, known as the distance signal. Lever No. 2 works another semaphore signal about 800 ft. from the draw, known as the home signal. Both of these semaphore arms, in case of breakage of the wire connections, go to danger automatically. Both the distance and the home signal posts are fitted with powerful lamps for night use, showing red when the arm shows danger and green when trains may pass cautiously, it being proper to run across all important bridges at a somewhat reduced speed. Lever No. 3 works a bolt which locks a switch in the main track about 600 ft. from the draw. This bolt cannot be thrown unless the switch is accurately set for the main track. Lever No. 4 works the switch leading to a spur siding, running off some 1,200 ft. to a gravel pit. Lever No. 5 works the lock of the bolt holding the draw in place. Before the bridge can be unlocked, that the draw may be opened for the passage of a vessel, these levers must all be thrown in the order given. It is physically impossible to use them in any other order, the interlocking preventing the draw tender or signal-man from moving the higher numbered lever until he has first moved the lower number. Supplemental apparatus is provided by which the electric current is made use of to indicate to the signal-man in the cabins respectively the approach of trains when at a distance of one and one-quarter miles in either direction, that the draw may not be opened and travel delayed unnecessarily. Electricity is also availed of to indicate in the cabins the position of the semaphore arms at the distance signal posts."

Norfolk & Western.—The New River Division is now completed to a point 68 miles from the junction with the main line at New River, Va., leaving only about 6 miles to complete the line to the terminus at Pocahontas. It is expected that the division will be completed and fully opened for traffic by the end of March, when shipments of coal will begin.

Northern Adirondack.—This company has filed articles of incorporation in New York to build a railroad from Moira, N. Y., on the Ogdensburg & Lake Champlain road, southward to St. Regis Falls, a distance of 11½ miles.

Ohio & Mississippi.—Receiver Douglas reports to the Court as follows for January:

Cash, Jan. 1.....	\$288,149
Receipts from all sources.....	525,149
Total.....	\$813,298
Disbursements.....	693,872

Cash, Feb. 1..... \$119,426
The disbursements exceeded the receipts by \$168,723 for the month. The payments included \$240,000 for coupons.

Osceola & Malden Short Line.—This company has been organized to build a railroad from Osceola, Ark., northward about 60 miles to Malden, Mo., on the Texas & St. Louis road. The distance is about 60 miles.

Pennsylvania.—The Philadelphia Ledger of Feb. 14 says: "We are authorized to state that there is no truth in the report, which has been circulating for a day or two, that the Pennsylvania Railroad management intended to ask the annual meeting of stockholders to authorize another increase of stock. This rumor, which originated in New York, has

steadily grown, as such stories do, until it yesterday reached the colossal proportions of \$20,000,000 proposed increase."

Two additional tracks are to be laid on the main line between Harrisburg, Pa., and Middletown, which will make five tracks between those points. It is probable that these additional tracks will be continued to the junction with the Columbia loop line.

Arrangements have been made to consolidate four of the minor leased lines in New Jersey, the Camden & Burlington County, the Pemberton & Hightstown, the Pemberton & Sea Shore and the Philadelphia & Long Branch. The consolidated company will be called the Philadelphia & Long Branch, and its line will extend from Camden to Point Pleasant. The consolidation will be chiefly formal and made for convenience.

A statement issued by this company shows the mileage of transportation lines owned, leased and controlled east of Pittsburgh and Erie on Jan. 1, 1888, as follows:

States.	Owned.	Leased and controlled.	Total.
New York.....	70.50	70.50	141.00
New Jersey.....	64.23	64.23	128.46
Pennsylvania.....	434.52	2,164.85	2,599.37
Delaware.....	164.05	164.05	328.10
Maryland.....	328.39	328.39	656.78
District of Columbia.....	8.18	8.18	16.36
Virginia.....	32.60	32.60	65.20
West Virginia.....	11.80	11.80	23.60

Total..... 434.52 3,435.40 3,859.92
Deduct canals and ferries..... 406.00

Total miles railroad..... 3,453.92

Of the total mileage 345.77 miles are classed as main line owned; 88.75 miles as branches owned; 2,255.85 miles as main lines leased and controlled, and 1,169.55 miles as branches leased and controlled. The total mileage of tracks, including sidings, is 5,906.22 miles.

Pensacola & Atlantic.—The track is now all laid on this road from Pensacola, Fla., eastward to the Apalachicola River, 180 miles. The bridge over that river is not quite finished, connection being made by steam ferry for the present. The road is controlled by the Louisville & Nashville, and connects that company's system at Pensacola with the Florida Central & Western, leading to Jacksonville. The new road passes through a section of West Florida as yet but little settled, but abounding in valuable timber and having much good land. It has a land grant from the state, which is said to include some excellent lands.

Philadelphia & Reading.—The car shops at Reading, Pa., have completed 4,000 new freight cars of all classes during the last two years.

The Receivers' cash account for December, as audited by the Master, is as follows:

Balance, Dec. 1.....	Railroad Co. Coal & Iron Co.	\$218,689	\$3,085
Receipts.....	3,591,734	1,304,596	
Total.....	\$4,210,423	\$1,310,281	
Disbursements.....	3,778,604	1,219,322	
Balance, Jan. 1.....	\$431,819	\$90,959	

The balance held by the Receivers on account of deferred income bond payments was \$13,524 on Jan. 1.

At the annual meeting of the Schuylkill Navigation Co. (whose property is leased to the Reading), in Philadelphia, Feb. 13, a committee was appointed to consider the propositions the Reading Co. may make for exchanging Schuylkill Navigation for Reading Railroad shares.

In the United States Circuit Court in Philadelphia, Feb. 14, a decree was entered ordering the Receivers to turn the equipment over to a trustee to be named by the company, on the amount due on the outstanding receivers' certificates being provided for. The equipment is to form the security for car-trust bonds or certificates to be issued by the trustee. The decree further directs the Receivers to transfer the road and all other property, outside of the equipment, to the company, so soon as proper provision is made for all the outstanding debts and obligations of the Receivers. A special Master is appointed to superintend the transfer and audit the final accounts of the Receivers, and the Court retains jurisdiction until the master's report of the transfer shall be made and approved.

There was no opposition to the decree, and it was presented and passed without delay. It will probably take two or three weeks to make the final settlements and complete the transfer of the property.

Pittsburgh, Cincinnati & St. Louis.—A dispatch from Columbus, O., Feb. 7, says: "The Ohio Supreme Court this morning decided the case of the Pittsburgh, Cincinnati & St. Louis Railway Co. vs. the Central Ohio Railway Co. and the Baltimore & Ohio Co. adversely to the plaintiff, by dismissing their petition and the cause at their costs. The suit was brought by plaintiff against the defendants as recognized, in which it was sought to have an order of partition made for that portion of the Central Ohio road lying between Columbus and Newark and other real estate, amounting in value to about \$2,500,000. The road passed from the control of the Central Ohio and into the hands of the Baltimore & Ohio in 1866, under a lease which has not yet expired. In 1868 or 1869 an arrangement was made between the Central Ohio and the Steubenville & Indiana companies by which the section of road in controversy was used jointly by them. In 1864 the former company decided to the latter the one undivided half of said section of road. In 1868 the Steubenville & Indiana Railway Co. was consolidated with the Pittsburgh, Cincinnati & St. Louis and thereafter and ever since the Baltimore & Ohio and the Pittsburgh, Cincinnati & St. Louis have been in possession jointly of the road. The question was whether this section of the Central Ohio could be sold, cutting it in two parts and leaving the stockholders in possession of but one of these parts, which is worthless without the other. The Supreme Court said that it could not be so divided. The best legal talent in the state was engaged on both sides. The question and the decision had been anxiously looked for by both parties."

Pittsburgh, McKeesport & Youghiogheny.—The temporary injunction recently granted to prevent the grading of certain tracks of the Pennsylvania Railroad under the line of what is locally known as the East End road, which is to carry this road into Pittsburgh, has been dissolved. It is said that the grading of the proposed tracks will render it impossible for the East End road to be built on the line proposed.

Rome, Watertown & Odensburg.—The temporary injunction against the payment of interest on the income bonds for 1883 has been dissolved, the stockholder who brought the suit having failed to prove his allegation that the interest had not been earned.

Rutland.—A statement made by the directors of this company is that the cash balance on hand does not warrant the payment of a dividend on the preferred stock in February. The company's resources will provide for the accruing coupons and for certain notes falling due in February and March, but it does not seem probable that any dividend will be paid before August next.

Scioto Valley.—The reported transfer of a controlling interest in this road to the Chesapeake & Ohio is not confirmed by the result of the annual meeting last week, when the old directors were re-elected with one exception. No Chesapeake & Ohio names appear in the board at all.

Securities on the New York Stock Exchange.—The following securities have been put on the lists at the New York Stock Exchange:

Chicago, Milwaukee & St. Paul. \$3,335,000 Wisconsin & Minnesota Division 40-year, 5 per cent. bonds.

Milwaukee & Lake Winnebago. \$520,000 common stock, \$780,000 preferred stock, \$520,000 income 5 per cent. bonds and \$1,430,000 first-mortgage, 30-year, 6 per cent. bonds; bonds to be a delivery only after registry by the Farmers' Loan & Trust Co. This road is leased to the Wisconsin Central.

New York, West Shore & Buffalo. \$30,250,000 first-mortgage, 5 per cent. bonds.

St. Louis & San Francisco. \$5,000,000 general mortgage, 50-year, 6 per cent. bonds.

Shenandoah Valley.—At a special meeting held in Luray, Va., the stockholders voted to approve and ratify the traffic contract with the Norfolk & Western Railroad Co., and the board was instructed to carry it into effect. It was also resolved to establish the headquarters of the company at Roanoke, Va., where the general offices will be kept hereafter.

Sioux City & Pacific.—Work is progressing on the bridge over the Missouri River at Blair, but the piers will hardly be ready for the superstructure before next summer. The bridge will be about 1,000 ft. long, and the piers are 105 ft. high from the caissons which form the foundations. The stone for the piers is brought from quarries near Mankato, Minn. Saulspugh & Co., of Rock Island, Ill., are the contractors for the masonry.

Staten Island Terminal.—This company has filed articles of incorporation in New York to build a railroad from Rossville, on the western side of Staten Island, to Edgewater on New York Bay, a distance of about 10 miles. It is probably intended to be the Staten Island end of the Reading's proposed line to a coal shipping point on the bay of New York.

Storm and Flood.—The effect of the floods in the minor streams in Ohio and Indiana, reported last week, became apparent in the Ohio River this week. The Ohio commenced rising rapidly Feb. 8, and the flood began to reach Cincinnati on the following day. By Feb. 14 it had reached its greatest height, the river standing a little over 66 ft., or nearly two feet higher than in the great flood of 1832, which is the highest water on record heretofore. A large part of the city was flooded, and nearly all the roads entering the city had their tracks covered by water and badly washed in places, while much damage was done to bridges and buildings. On Feb. 14 the Cincinnati, Hamilton & Dayton was the only road upon which trains could enter the city, and its tracks were used by all the lines from the east. The Ohio & Mississippi kept up communication only by steamboat to Aurora, from which place it was possible to run trains. The freight and passenger stations of the Cincinnati Southern were undermined by the water and fell, doing much damage and probably killing two or three persons. Latest reports are that the Cincinnati, Hamilton & Dayton tracks are also obstructed.

At Louisville the city was badly damaged, but the railroads suffered less, the lines entering the city from the south not being exposed to the flood. All the roads coming into New Albany and Jeffersonville were, however, badly damaged, and fears are entertained that much damage will be done at points below, especially at Cairo.

Toledo, Texas & Rio Grande.—This company has executed a mortgage for \$2,500,000 to cover an issue of bonds to be made for the purpose of building the road. The company has no road built as yet; the proposed line is from Charleston, Ill., southward to Cairo, about 190 miles. It is intended to connect the Toledo, Cincinnati & St. Louis with the Texas & St. Louis road.

Union Pacific.—Judge Dillon, the New York counsel for the company, makes the following statement: "A controversy exists between the Union Pacific and the United States as to the manner in which net earnings under the Thurman act shall be ascertained. The company, under the advice of counsel and under their construction of the decisions of the Supreme Court, claim to have the cost of new construction and equipment on the main line deducted from the gross earnings in order to ascertain the net earnings. The Commissioner of Railroads does not concede this claim, and both parties desire a judicial decision thereof; and an amicable suit to that end, invited by the company, is about to be brought. The government, under its construction, claims that there is due to it \$901,873.03; the company claims that there is due only \$306,477.07. The company has not paid because it has a counter claim against the United States for postal service of over \$1,500,000. The company has brought suit for postal compensation, and the Supreme Court recently decided in favor of the company and against the principle claimed by the Postmaster-General, and the amount due to the company is awaiting judicial determination. The company's claim against the government for postal service is much greater than any claim of the government against it under the Thurman act. The company's purpose being, when both disputes are adjusted, to set off one against the other, the officers of the government have made no complaint of the course pursued by the company, but have favored a judicial settlement of the questions at issue."

The Oregon Short Line now has track laid to Shoshone, Idaho, the junction with the Wood River Branch, the new terminus being 32 miles west of the late terminus at Kimama, and 321 miles from the main line at Granger, W. A regular train will be run to Shoshone about March 1. Track-laying will soon be begun on the Wood River Branch.

Vincennes, Jasper & Ohio River.—This company has been organized to build a railroad from Vincennes, Ind., southeast through Petersburg to Jasper, a distance of about 45 miles.

Wabash, Paducah & Southern.—This company has filed articles of incorporation to build a railroad from a point on the Ohio River opposite Paducah, Ky., to Metropolis, Ill., and thence to a junction with the projected Toledo, Texas & Rio Grande road in Williamson County. The office of the company is in Metropolis, Illinois.

Western Union Telegraph.—This company has again disposed of competition by leasing the lines of the Mutual Union Telegraph Co., on the terms noted elsewhere.

Another suit has been begun by a stockholder to enjoin the company from carrying this lease into effect. This is an addition to the numerous suits already pending against the company.

York Beach.—This company has been organized to build a narrow-gauge line from the Eastern Railroad at Kittery, Me., to York Beach, a distance of 10¼ miles.